NOV. 19, 1955 PAGES 1045 TO 1096

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, PATHOLOGY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 6899 LONDON: SATURDAY, NOVEMBER 19, 1955 CCLXIX

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Tests of Adenohypophyseal Function
A. C. CROOKE, M.D. 1045
Treatment of Œsophageal Hiatus Hernia
N. C. TANNER, F.R.C.S. 1050
Subacute Bacterial Endocarditis in the Elderly
H. J. ANDERSON, F.R.C.P.
J. S. STAFFURTH, M.R.C.P. .. 1055
Early Diagnosis of Subacute Bacterial Endocarditis
JOHN WEDGWOOD, M.R.C.P. 1058
Chlorpromazine in the Management of Tetanus
A. C. E. COLE, F.R.C.P.
D. H. H. ROBERTSON, M.B. 1063
Secondary Hæmochromatosis
D. M. DAVIES, M.R.C.P. 1064
Congenital Intestinal Atresia
Prof. J. H. LOUW, M.B.
C. N. BARNARD, M.D. 1065

PRELIMINARY COMMUNICATION

Urinary Steroids After Prednisone
Prof. C. H. GRAY, M.R.C.P.
MARGARET GREEN, B.SC.
N. J. HOLNESS, PH.D.
BARBARA LUNNON, M.SC. 1067

SPECIAL ARTICLES

The Use and Limitations of Cortisone in General Practice
R. I. S. BAYLISS, M.R.C.P. .. 1078
General Practice in Scotland 1082

IN THE MENTAL HOSPITAL

Group Work-therapy in Holland
JOAN BURR, S.R.N. 1083

MEDICAL SOCIETIES

British Society of Gastro-enterologists 1067

NEW INVENTIONS

An Œsophago-gastroscope with Inflator
H. DAINTREE JOHNSON, F.R.C.S. 1070

REVIEWS

Notices of Books 1069

LEADING ARTICLES

THE USE OF CORTISONE 1071
SUBACUTE BACTERIAL ENDOCARDITIS 1072
GENETICS OF SICKLING 1073

ANNOTATIONS

R.C.S. in Manchester 1075
Prevention and the Practitioner 1075
Ultra-fine Structure of Collagen 1075
Cancer of the Thyroid 1076
Xeroradiography 1077
Defence of Research 1077

PUBLIC HEALTH

Alcoholism in France 1083
Poliomyelitis 1084

THE WIDDICOMBE FILE

XXIX. Specialist without a Specialty? 1084

LETTERS TO THE EDITOR

Poliomyelitis in South-East London (Dr. L. J. M. Laurent) 1087
Infection Acquired in Hospital (Dr. Robert Blowers, Mr. J. Potter, F.R.C.S.E., Dr. K. R. Wallace; Mr. A. H. Baker, F.I.M.L.T., Mr. F. G. S. Whitfield, F.R.E.S.) 1087
The Climate of Discovery (Dr. J. M. Alston) 1088
Psychosomatic Problems in Postural Re-education (Mr. W. E. Tucker, F.R.C.S.) 1088
The Heaf Tuberculin Test (Prof. Frederick Heaf, F.R.C.P.) 1089
Prevention of Goitre (Dr. Isidor Greenwald) 1089
Marginal-punched Cards (Dr. A. I. Macdougall; Dr. A. Garvie) 1089
Deaths After Anæsthesia (Mr. B. W. Howell, F.R.C.S.) 1090
Lysergic Acid in Mental Deficiency (Dr. Margaret Davies, Dr. T. S. Davies) 1090
Nephrosis and Malaria (Dr. H. J. Goldsmith) 1090
Monilia Endocarditis (Dr. W. A. Bourne) 1090
Transillumination of the Larynx (Dr. I. W. Magill) 1090
An Unusual Epidemic (Dr. A. L. Wallis) 1091
The Excretion of Radioactive Iodine in Human Milk (Dr. E. E. Pochin) 1091
Argentaffin Carcinoma (Dr. R. S. Stacey) 1091

PARLIAMENT

Purchase-tax on Crash-helmets. 1085
Question Time 1085

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents .. 1086

OBITUARY

Arthur Ralph Thompson 1092
William Mackenzie 1092
Edith Margaret Taylor 1093
Muriel Helen Deem 1093

NOTES AND NEWS

Domiciliary Visits by Whole-time Specialists 1094
Study, Experiment, and Demonstration 1094
A New Blood-transfusion Centre 1094
Schizophrenic Art 1094
The Horse Shoe Club 1095

University of London 1095
University of Birmingham 1095
University of Liverpool 1095
Royal College of Surgeons of England 1095
Royal College of Physicians of Ireland 1095
Royal College of Physicians of London 1095
Royal Faculty of Physicians and Surgeons of Glasgow 1095
Royal Society 1095
Medical Research Council 1095
Symposium on Stammering 1095
Royal Society of Medicine 1095
British Diabetic Association 1095

Diary of the Week 1096
Appointments 1096
Births, Marriages, and Deaths .. 1093

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TESTS OF ADENOHYPOPHYSEAL FUNCTION *

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THE study of diseases of the adenohypophysis has generally followed a common pattern. The first description of the clinical picture is often confused and confined to a few examples. Later a number of such descriptions are gathered together and a common pattern is recognised. This is followed by an account of the morbid anatomy. Finally the biochemical changes, including the hormonal balance, are worked out. This sequence of events is exemplified in the study of basophilism.

In 1932 Cushing described the clinical appearance of his patients who presented the picture which subsequently became known by his name. To these he added a number of others previously reported, and he claimed that the disease was caused by an adenoma of basophil-cells in the anterior lobe of the pituitary gland. Twenty years ago I showed that the constant pathological finding in the adenohypophysis is a hyaline change in its basophil-cells and that adenomata are not constant and, when present, are not necessarily composed of basophil-cells. Attempts to elucidate these pathological findings by clinical investigations and by experiments on animals led to prolonged arguments but no conclusions. Even the more recent histochemical studies have failed to provide a satisfactory solution.

At an early stage my interest shifted from the morbid anatomy of the pituitary gland to the biological and chemical properties of its hormones as it became apparent that a fuller understanding of its pathology rested on the measurement of its functional capacity. I next developed a test for adrenocorticotrophic hormone using hypophysectomised rats, and this enabled Cortis-Jones, working with me at the London Hospital, to demonstrate that adrenocorticotrophic hormone is ultrafiltrable. Later we were joined by Morris, but subsequent stages in the purification were delayed by the war and it was not possible to publish this work until afterwards (Cortis-Jones, Crooke, Henly, Morris, and Morris 1950). Although this was interesting fundamental research it brought us little nearer to our goal of estimating pituitary function in man. Since opening the Department of Clinical Endocrinology in Birmingham, however, our principal interest has been in pituitary-function tests. I propose, therefore, to review the methods which are available and to attempt to assess their usefulness, and finally to describe briefly some of our own work on this subject.

Tests of adenohypophyseal function may be divided roughly into four groups. In the first group a measurement is made of some indirect effect of a gland which is itself influenced by the pituitary gland. Among such tests are the measurement of the basal metabolic rate, the insulin-sensitivity test, Kepler's test of water-load, and the excretion of certain breakdown products such as 17-ketosteroids, pregnanediol, and the œstrogens. In the second group a measurement is made of the synthesis, secretion, or excretion of a hormone produced by a gland which is itself influenced by the pituitary gland. Among such tests may be included the uptake of radioactive iodine by the thyroid gland, the level of circulating protein-bound iodine, and the excretion of certain corticoids and perhaps of specific 17-ketosteroids and œstrogens. In these two groups it is presumed that when a number of tests indicate poor function of several glands there is some degree of pituitary insufficiency, but these tests give no indication of increased pituitary function. Obviously such indirect measures give a poor estimation of pituitary activity, and I do not propose to discuss them more fully.

The third group of tests is a modification of the first two in which the same functions are measured but the measurements are repeated after treatment of the patient with specific pituitary trophic hormones. The hormones which lend themselves to such investigations are the adrenocorticotrophic, thyrotrophic, and gonadotrophic. These tests are more specific than those in the previous groups because they demonstrate the ability of a gland to respond to pituitary stimulation, thus distinguishing between primary and secondary failure of the gland. They cannot demonstrate increased pituitary secretion, but they seem to be a considerable advance on older methods and are likely to become more widely used, and I propose to discuss them more fully.

The fourth group of tests entail the direct measurement of specific pituitary hormones in blood or urine. Such tests are urgently needed in order to recognise specific types of adenohypophyseal failure and to distinguish these from failure of an end-organ to respond to pituitary stimulation, and finally to diagnose specific types of excessive pituitary stimulation. I propose to describe what has been attempted so far in this group of tests, although only the measurement of gonadotrophic hormones can be regarded as practicable for limited studies in well-equipped departments.

Tests depending on Measurement of Effect of Treatment with Specific Pituitary Trophic Hormones

CORTICOTROPHIN

In recent years several tests have been proposed in which is measured some indirect effect of adrenocortical secretion in response to stimulation with corticotrophin (A.C.T.H.). Examples are Thorn's test, in which the fall in the relative number of circulating eosinophil-cells is estimated, and the excretion of breakdown products such as 17-ketosteroids. Such tests offer poor comparison with the direct measurement of adrenocortical hormones in circulation or their excretion in urine after stimulation with corticotrophin.

The development of a method for determining the level of 17-hydroxycorticosteroids (principally 17-hydroxycorticosterone or compound F) in blood by Nelson and Samuels in 1952 has opened new fields for investigation. Using this techinque Bliss et al. (1954) and Eik-Nes et al. (1954) compared the effect of rapid intravenous injections of corticotrophin with infusions given over longer periods of time, and concluded that 25 I.U. of corticotrophin given as an intravenous infusion over a period of six hours was the most suitable for testing adrenocortical response. The response of different individuals in the control series varied considerably, but the characteristic response of each was unaltered in successive tests using different doses of corticotrophin. The test has been applied principally to the detection of primary adrenocortical failure, but it has been shown to be sufficiently sensitive to detect less severe failure in patients dying of pulmonary tuberculosis whose adrenal glands were found at necropsy to be unaffected by tuberculosis. These patients had normal blood-levels of 17-hydroxycorticosteroids during the control period but failed to respond to stimulation with corticotrophin—a condition described as low adrenal reserve. Some patients with mild Addison's disease also showed low adrenal reserve in contrast with the usual finding in patients with severe disease who have low levels of 17-hydroxycorticosteroids initially.

The methods for determining 17-hydroxycorticosteroids in blood are rather complicated and are unsuitable for

* Presidential address to the Section of Endocrinology of the Royal Society of Medicine, Oct. 26, 1955.

routine laboratory use; but simpler methods have been developed for their determination in urine by Reddy et al. (1952), J. H. U. Brown (1955), and Appleby et al. (1955). These procedures have a disadvantage when applied to patients with disease of the liver or kidneys, because the conversion and excretion of steroids in the urine may be impaired (Brown et al. 1954). Liddle et al. (1954), however, used the urinary method of Reddy et al. (1952) and found that an intravenous infusion of 40 I.U. of corticotrophin given over a period of eight hours caused about a fivefold increase in the amount of 17-hydroxycorticosteroids excreted daily by a group of 64 control patients. There was considerable individual variation in the response, as was reported earlier in investigations on the blood-levels. Growth hormone and thyrotrophic hormone had no effect on the rate of excretion.

Because corticotrophin has to be administered by intravenous infusion the test is not easily used in routine practice. Gemzell and Frankssom (1953) tried a slowly acting corticotrophin preparation. They found that 50 I.U. given intramuscularly caused a greater rise in the blood-level of 17-hydroxycorticosteroids after eight hours than 20 I.U. of ordinary corticotrophin given by infusion. Bayliss and Steinbeck (1953) objected that the results obtained with slowly acting corticotrophin are too variable but Forsham et al. (1955) showed, by careful study of the action of corticotrophin gel, that increasing dosages given intramuscularly caused the hourly output of 17-hydroxycorticosteroids in urine to increase at the same rate but for progressively longer periods. They proposed a dosage of 80 I.U. of the gel and the measurement of 17-hydroxycorticosteroids in urine during the succeeding eight hours as a standard procedure (Orr et al. 1954).

There is a distinct diurnal variation in both the blood-level (Tyler et al. 1954) and the urinary output (Doe et al. 1954) of 17-hydroxycorticosteroids, and it might be preferable for a routine laboratory test to be based on the amount excreted during a period of twenty-four hours. This would require a larger dose of corticotrophin gel, such as 120 I.U. (Nabarro 1954). It might be useful if the Medical Research Council's Committee on Clinical Endocrinology would explore this question and recommend a procedure for general routine use. It would be a great advance on methods previously available for detecting adrenocortical insufficiency, whether primary or secondary to pituitary failure.

THYROTROPHIC HORMONE

Investigators have used thyrotrophic hormone (T.S.H.) to distinguish between primary hypothyroidism and hypothyroidism due to pituitary insufficiency. Earlier workers measured the basal metabolic rate and other indirect indices of thyroid function after injections of T.S.H., but Querido and Stanbury (1950) used the increase in the level of circulating protein-bound iodine (P.B.I.) and the uptake of radioactive iodine by the thyroid gland after treatment with T.S.H. as indices of increased thyroid function. Perloff et al. (1951), using a similar procedure, gave a tracer dose of 50 μc carrier-free I^{131} orally, and measured the activity at the neck twenty-four hours afterwards. Approximately two weeks later they gave 20–30 mg. of T.S.H. intramuscularly on three successive days and repeated the tracer studies after the last injection. The difference in the percentage of iodine taken up at the neck was used as an index of response to T.S.H. Schneeberg et al. (1954) subsequently found with this test a clear difference in the response between a group of 22 patients with primary thyroid deficiency and 12 with thyroid deficiency secondary to Simmonds's disease, and there was no overlapping of results between groups. They also showed that these two groups could be readily distinguished from 24 healthy controls by this procedure.

These tests are cumbersome, and Jefferies et al. (1953) proposed a simplified procedure.

They gave I^{131} in a dosage of 10 μc to adults and 3–5 μc to children, and three hours afterwards they measured the uptake at the neck with a scintillation-counter. The lower thigh served as control for the background. Immediately after this they injected 10 mg. (4 U.S.P. units) of T.S.H. intramuscularly. Twenty-four hours after the first dose of iodine and immediately after a preliminary count at the neck they gave a second dose of I^{131} and measured the uptake again three hours later. The difference in I^{131} uptake before and after treatment with T.S.H. was used as an index of response.

Their results appear to be comparable with those obtained by other workers using more lengthy procedures. We have repeated their test and the chief objection seems to be that measurements are made at a time when the uptake of iodine is very rapid and before it has become bound in the thyroid gland. We have found it necessary to measure the radioactivity twenty-four hours after giving I^{131}. Vale et al. (1955) have claimed recently that some patients with Simmonds's disease require multiple injections before a response can be obtained.

This test can be done on outpatients, and provided the necessary apparatus is available it is simple and rapid. It is sensitive enough to demonstrate low thyroid reserve —a condition (comparable to low adrenal reserve described in the previous section) in which failure of the thyroid gland is slight and symptoms are mild. The initial uptake of iodine in this condition is normal, but treatment with T.S.H. does not cause any further increase. Finally, the test clearly differentiates between primary thyroid insufficiency and insufficiency caused by pituitary failure. Patients having thyroid therapy or iodine may cause confusion because, like patients with Simmonds's disease, their initial iodine uptake is low and it increases after treatment with T.S.H.; but unlike patients with Simmonds's disease their initial level of protein-bound iodine is normal. The test promises to be of much greater value than any other so far developed for distinguishing between minor degrees of primary and secondary thyroid failure and to warrant consideration as a routine procedure provided enough T.S.H. can be obtained at a reasonable price.

HUMAN CHORIONIC GONADOTROPHIN

This hormone (H.C.G.) stimulates the production of 17-ketosteroids and of œstrogens, but no attempt seems to have been made to develop a test of pituitary and gonadal function with it. Birke et al. (1954) fractionated the 17-ketosteroids by the method of Zygmuntowicz and found a considerable increase in the excretion of androsterone and ætiocholanolone after three daily injections of 600 I.U. of H.C.G. This suggests that a practicable test could be devised, but there has been considerable controversy about the possibility that H.C.G. stimulates the adrenal cortex. Borth et al. (1953) made a careful study of the effect of H.C.G. on the excretion of 17-ketosteroids, formaldehydogenic corticoids, and œstrogens in six oöphorectomised women but found no change. Indeed, if it is true that a preparation of H.C.G. stimulates adrenocortical secretion, that preparation is, by definition, adrenocorticotrophic and it becomes a question of chemical identity which is far from solution.

The methods used for the chemical determination of œstrogens and pregnanediol in urine have not been satisfactory, but the procedures described recently by J. B. Brown (1955) and Klopper et al. (1955) are practicable procedures and the way now appears to be open to develop a test of ovarian function using H.C.G. The chief obstacle to such a test is that during the reproductive phase of life control values are not easily defined, owing to the cyclical variation in the amount of these hormones excreted. This, however, should not hamper the use of the test for distinguishing between failure caused by primary disease of the ovary and failure secondary to pituitary insufficiency. The criticism that H.C.G. stimu-

lates the adrenal cortex to produce œstrogens has been raised by several workers, including Decio (1955). This requires further investigation, but again it is a question of chemical identity of the trophic hormones.

The possibility of using two or more of these tests simultaneously in a simplified form is interesting. Such a development would go some distance towards gaining a better understanding of pituitary disease, but the real need is for methods of measuring pituitary trophic hormones themselves in urine or, better still, in blood.

Measurement of Pituitary Trophic Hormones

One of the principal difficulties in the way of measuring pituitary hormones lies in their chemical constitution. They are all believed to be protein or polypeptide in nature, and methods of assay often depend on complicated biological procedures. A second difficulty is that they are to a variable extent biologically interdependent, sometimes facilitating and sometimes inhibiting each other's actions. A third is that although some are now well defined others are not and their final number is not known. I can only describe briefly some of the efforts which have been made to assay those hormones which have already been found in human urine or blood.

GROWTH HORMONE OR SOMATOTROPHIC HORMONE

Somatotrophic hormone (S.T.H.) has proved one of the most elusive hormones in human blood and urine, although it has been isolated as a homogeneous protein from pituitary glands. An elaborate assay has been developed for it by Greenspan et al. (1949). This consists in measuring the thickness of the silver-stained epiphyseal cartilage of the femur of hypophysectomised rats after a course of injections with the hormone. Greenspan (1950) used the assay subsequently in an effort to demonstrate S.T.H. in lyophilised serum of growing children and patients with acromegaly, but without success. Recently Gemzell et al. (1955), using the same assay, have demonstrated S.T.H. activity in vaginal blood obtained post partum, after fractionation with ethanol. They then repeated Greenspan's work on lyophilised blood and found S.T.H. activity there also. This assay cannot be regarded yet as a practical procedure although it is one of those which is most urgently required for clinical investigation.

THYROTROPHIC HORMONE

A large number of different methods have been devised for the assay of T.S.H. The first depended upon changes in the weight of the thyroid glands of various animals; later methods depended on morphological changes (De Robertis 1948); and yet others on growth and metamorphosis of tadpoles (D'Angelo et al. 1942). Most subsequent workers have attempted to measure some factor directly related to the secretion of thyroid hormone. Some have measured the uptake of radioactive iodine (Querido et al. 1953, Overbeek et al. 1953, Gilliland and Strudwick 1953) or radioactive phosphorous (Besford, Crooke, and Matthews 1952, Dedman et al. 1953, Kriss et al. 1954, Lamberg 1955, Lamberg et al. 1955, Tala et al. 1955, Wahlberg 1955) by the thyroid glands of various animals, while others have measured the changes in the level of protein-bound iodine in animals after treatment with T.S.H. (Adams and Purves 1955). Most of these workers have attempted to apply their methods to detecting or measuring T.S.H. in human blood or urine, but the results so far have been disappointing.

There is evidence of the existence of two thyrotrophic factors—one concerned with growth of the gland and the other with its secretion (Greer 1952). Assays based on changes in thyroid weight or on the height of its epithelial cells may not, therefore, be measuring the same substance as assays based on factors directly connected with secretion.

Another factor has been obtained from pituitary extracts which appears to be related to T.S.H. It was described by Dobyns and Steelman (1953), who called it the exophthalmos-producing substance (E.P.S.). They have separated it by precipitation with trichloracetic acid from the factors which cause an increase in weight and in secretion of the thyroid gland. It is assayed by its effect in producing proptosis in the Atlantic minnow, *Fundulus Heteroclitus*. Subsequently Dobyns and Wilson (1954) demonstrated the presence of E.P.S. in the serum of patients with "progressive" exophthalmos.

It is evident that big advances have been made in the assay of the various thyrotrophic factors but that no final decision has been reached about which are the best techniques. Their application to human disease has hardly yet begun, but it is reasonable to hope that within a fairly short time clinical methods will become available at least for research purposes.

CORTICOTROPHIN

The various methods which have been developed for the assay of corticotrophin (A.C.T.H.) have nearly all been based on one procedure—the depletion in the concentration of ascorbic acid in the adrenal gland of the hypophysectomised rat (Sayers et al. 1948). Using this method, but varying the extraction procedure or the method of administration to animals, many different groups of workers have tried to assay corticotrophin in blood (Cooke et al. 1948, Taylor et al. 1949, Granirer 1951, Gray and Parrott 1953, Sydnor et al. 1953a and b, Ceresa and Reyneri 1953, Paris et al. 1954, Gaarenstroom et al. 1954, Moruzzi et al. 1954), and in urine (Rubin et al. 1954). Sayers (1955) has criticised the results obtained by some of these workers and shown that the concentrations which many have claimed to have found in blood are unrealistic since if such concentrations were maintained artificially Cushing's syndrome would develop. He stated that the normal blood-level is less than 0·5 milli-unit per 100 ml. blood, which is below the limit of detection; but it becomes detectable in patients with Addison's disease or after adrenalectomy.

In 1951 Dixon et al. distinguished two adrenocorticotrophic factors—one which caused adrenocortical repair and the other depletion of ascorbic acid in the adrenal cortex of the hypophysectomised rat. This suggested that corticotrophin has two factors—one concerned with the growth of the gland and the other with its secretion, similar to the two T.S.H. factors already mentioned. It raises a question about the desirability of exploring other techniques for methods of assay.

A new method was reported recently which depends on the storage of liver glycogen under the influence of corticotrophin (Overbeek and van der Vies 1954), but it has not been applied clinically. Another method of particular promise depends on the production of measurable quantities of 17-hydroxycorticosteroids by portions of rat adrenal gland in vitro (Saffran and Bayliss 1953, Saffran and Schally 1955, McKerns and Nordstrand 1955). The steroids have been identified as corticosterone and 17-hydroxycorticosterone (Elliott and Schally 1955). This assay has several advantages. It does not require hypophysectomised rats, the glands of a single animal serve as controls on the unknown material, the end-point is the measurement of the active hormone produced, and the procedure is statistically sound and has a λ of 0·15. Unfortunately it is not sensitive enough for clinical use in its present form, but it seems to be worth further investigation.

A short time ago it was claimed that corticotrophin was identical with the hormone which acts on melanophores and could be measured by its action on them. This claim was not substantiated, but it is evident that a melanocyte-stimulating hormone (M.S.H.) exists in man (Lerner et al.

1954) which is readily measurable by an in-vitro technique in which its action on the melanophores in a piece of skin of a frog is measured photo-electrically (Shizume et al. 1954). Normal urine extracted with benzoic acid and ethanol and normal blood extracted by adsorption on oxycellulose have been shown to contain measurable quantities, and the level is raised during pregnancy and in Addison's disease (Shizume and Lerner 1954). The technique appears to be simple and reliable, but it is difficult to know what is the significance of M.S.H. in human disease or what relation it bears to corticotrophin. The two hormones generally appear to increase together.

One may conclude that the clinical assay of corticotrophin and its related hormones is already practicable on a very limited scale and that further rapid development in this field is probable.

THE GONADOTROPHIC HORMONES

Three groups of gonadotrophic hormones have been investigated in man. The first of these includes prolactin or lactogenic hormone and luteotrophic hormone (L.T.H.). These may be identical, although this has not been established beyond doubt. The second comprises the pituitary gonadotrophins, which have two biologically distinct components called luteinising or interstitial-cell-stimulating hormone (I.C.S.H.) and follicle-stimulating hormone (F.S.H.). There is some evidence that these two factors are always present in the same ratio to one another, and they may therefore represent different biological actions of the same molecule of hormone; but Walter (1955) in Edinburgh and P. S. Brown (1955b) in our laboratory have recently established, by different methods, that this is not so. The third is human chorionic gonadotrophin (H.C.G.).

H.C.G. has been studied clinically to a greater extent than any of the pituitary trophic hormones. It is recognised by the familiar Aschheim-Zondek, Friedman, Frank and Hogben tests; but, since it is not derived from the pituitary gland, it would not be relevant to discuss it in this review of pituitary function tests, except to differentiate it from other gonadotrophic factors.

Prolactin and Luteotrophic Hormone

Few attempts have been made to assay prolactin clinically. In 1951 Coppedge and Segaloff described a method of extracting it from urine, which they then assayed in pigeons using the hypertrophy of the crop gland as an end-point. They claimed to be able to recognise a peak in the amount excreted during the secretory phase of the normal menstrual cycle. We experimented with a similar method at about the same time but found that the cost was exorbitant.

There is strong evidence that prolactin or luteotrophic hormone (L.T.H.) acts upon the prostate (Segaloff et al. 1955). It may be a secretomotor hormone acting on both the male and female secondary sexual glands, and we have been investigating the possibility of using its action on the rat prostate as a method of assay.

The Pituitary Gonadotrophic Hormones F.S.H. and I.C.S.H.

More attention has been given to the assay of this group than to any of the other trophic hormones, because of the relative ease with which some sort of result can be obtained. Most clinical studies date from the description of a method by Klinefelter et al. (1943). This consists in administering different dilutions of an extract of a twenty-four-hour sample of urine to immature female mice. Usually two mice are used for each dilution, and the increase in the weight of the uterus is used as the end-point for an "all-or-none" type of response. Most workers accept a twofold increase in the weight of the uterus over the control value as a positive result. This procedure is in widespread use, and it is generally called the Klinefelter-assay. Modifications have been introduced, mainly into the extraction procedure. They include ultrafiltration, precipitation with benzoic acid and tannic acid, and extraction by adsorption on kaolin followed by elution with alkali and precipitation with acetone—this last procedure has gained most favour in this country. Further purification of the kaolin extract by chromatography on calcium phosphate has been developed in our laboratory (Butt and Crooke 1953). It enables the hormone, concentrated from more than a litre of urine, to be injected into a single mouse without evidence of toxicity. This has been confirmed by Loraine and Brown (1954), who have integrated it into their routine method of assay for gonadotrophins.

The magnitude of the error of the Klinefelter-assay is not generally known, but in our hands it is many hundreds per cent. There are several reasons for this.

Firstly the method is notoriously unspecific. Secondly the amount of hormone excreted in a twenty-four-hour sample of urine is generally insufficient for an adequate number of mice to be used at each concentration of extract tested. Thirdly the methods of extraction from urine leave much to be desired. We think that the hormone is brought out of urine by co-precipitation with other proteins. Certain protein precipitants which we have used for extraction do not precipitate pure glycoproteins, but the pituitary gonadotrophic hormones are generally considered to be glycoproteins. Thus large quantities may be left behind, often in too dilute or too toxic solutions to be capable of demonstration except by special techniques. Fourthly, although it is generally believed that the kaolin-acetone extraction-procedure removes all œstrogens, it has recently been observed in our laboratory (Butt 1955) that biologically significant amounts of œstrogen are bound to proteins and taken through to the final extract which is injected into the mice. This protein-bound œstrogen may be partly responsible for the uterine hypertrophy which characterises a positive response.

Fortunately the differences in concentration of hormone in urine are so great that the Klinefelter-assay has been found to give results of clinical value. For research purposes, however, two things are necessary: the setting up of a standard preparation of human pituitary gonadotrophin, and the development of quantitative and, if possible, selective methods of assay. The former need has been met by the preparation of a standard extract made from the urine of women who have passed the menopause. This is called HMG20A and has been made by Organon Laboratories Ltd., at the instigation of the Medical Research Council's Committee on Clinical Endocrinology. The demand for more quantitative and specific assays has been met by several workers in different ways. P. S. Brown (1955a), working in our laboratory, developed a quantal assay, and Loraine and Brown (1954), in Edinburgh, a quantitative assay based on the uterine response of the immature mouse. With both of these it is practicable to estimate potencies with an error of about ten per cent.

Steelman and Pohley (1953) have introduced a new method which they thought might be specific for F.S.H. They treated young female rats with sufficient H.C.G. to produce maximum hypertrophy of the ovary. They then found that the addition of F.S.H. caused further hypertrophy. It was suggested that the luteinising action of H.C.G. might be identical with that of pure pituitary I.C.S.H., which is not available for such work. If so the contamination of a preparation of F.S.H. with I.C.S.H. should not affect the result of the assay and it might be considered as specific for F.S.H. P. S. Brown (1955a) has applied this principle to immature mice and developed a statistically satisfactory assay. He has used this method simultaneously with his quantal method on the urine of women who have passed the menopause, and compared the results with those obtained on urine from the same individuals after they have been treated with cortisone (P. S. Brown, personal communication). The reduction in the amount of gonadotrophin excreted after treatment is significantly different when measured by the two assays. This demonstrates a qualitative change in

the character of the pituitary hormones being excreted by these women after cortisone therapy and shows that the two assays are measuring different effects.

In 1942 Greep et al. claimed that I.C.S.H. causes restoration or hypertrophy of the prostate of the hypophysectomised rat and that the result is not influenced by the presence of F.S.H. This observation has formed the basis of assays for I.C.S.H. The use of hypophysectomised rats is cumbersome and limits the number of examinations that can be made, but Loraine and Brown (1954) have obtained satisfactory data for valid assays. Recently Segaloff et al. (1955) have stated that contamination of an extract with small quantities of prolactin (or L.T.H.) may enhance the effect of I.C.S.H. fivefold and seriously affect the results of an assay. It is possible that prolactin is present in the extracts of urine used for this assay. The method is being used routinely for clinical studies, however, by McArthur et al. (1955), who have demonstrated two peaks in the excretion of I.C.S.H. during the normal menstrual cycle.

The present status of the assays for pituitary gonadotrophic hormones may be summarised as follows. The crude, unspecific, semiquantitative Klinefelter-method is available in many centres for routine clinical investigation; but the more elaborate, more specific, and quantitative methods for F.S.H. and I.C.S.H. are only now beginning to become available for research purposes.

The Chemistry of Pituitary Gonadotrophins in Urine

Most workers have concentrated on the development of more specific and sensitive biological procedures, and we thought that it might be better to approach this problem from a chemical standpoint. If it is possible to separate the factors which have different biological actions by chemical means it would be permissible to assay them by less specific biological methods.

Starting with kaolin extracts of urine we succeeded in separating H.C.G. from the pituitary gonadotrophins by adsorption on tricalcium phosphate (Butt and Crooke 1953). The pituitary gonadotrophins can be eluted with disodium hydrogen phosphate, and we called this extract G.A. H.C.G. can be eluted with trisodium phosphate, and we called this extract G.B. We then found that G.A. obtained by chromatography on columns is electrophoretically homogeneous on paper, and we measured the concentration in urine by various methods (Crooke et al. 1954). These included the ninhydrin reaction using glycine as a standard, the orcinol reaction using glucose as a standard, and the polarographic method for proteins. The results obtained by the different methods were comparable. We then measured the output of G.A. in the urine collected each night during eight menstrual cycles by a group of five women who were menstruating normally. We found two peaks in the excretions—one just before the middle of the cycle and one just before or during menstruation. The amount excreted at the peak averaged eight times the amount excreted at the trough or lowest point in the cycle. When the results were plotted the curves were remarkably smooth, and we thought that they probably reflected the amount of biologically active hormone excreted. At this time we could only use the crude Klinefelter-assay in order to check our results, because the new assays had not been developed. The biological results were valueless, however, because of the enormous inaccuracy of the assay.

Since this paper was published we have collected large amounts of extracts from many different sources, including urine from women who have passed the menopause, from women during the follicular and the luteal phases of the cycle, from women with ovarian agenesis, from young children, and from men. These extracts have been assayed by our new methods, and we have found that the biological results do not correspond with the chemical results. We now think that it is possible that G.A. may contain a carrier protein with which biologically active components may combine or from which they may be detached. It is interesting that the excretion of G.A. fluctuates so regularly during the normal menstrual cycle and that it can be materially reduced by treating the patient with œstrogen. It is likely that the excretion of G.A. represents some function of pituitary gonadotrophic hormone and that the determination of some component of G.A. in urine may have a clinical value comparable to the determination of 17-ketosteroids which Callow and I first recommended for the diagnosis of adrenocortical carcinoma.

Meanwhile, the extracts which we have collected from various sources are being used for chemical studies. We have found that when these are measured by ultraviolet absorption at 280–290 mμ we obtain a much better approximation to the biological activity. More recently we have been able to fractionate G.A. further by countercurrent distribution in cellosolve-salt-water mixture and by chromatography on borate-buffered ion-exchange resins (Butt 1955 and personal communication). This work is being pursued because we believe that in the future methods will be developed for the chemical determination of all pituitary trophic hormones along lines similar to those which we have outlined. But I should like to conclude by emphasising the vital importance of the closest possible collaboration between clinician, physiologist, and chemist in all this research.

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TREATMENT OF ŒSOPHAGEAL HIATUS HERNIA *

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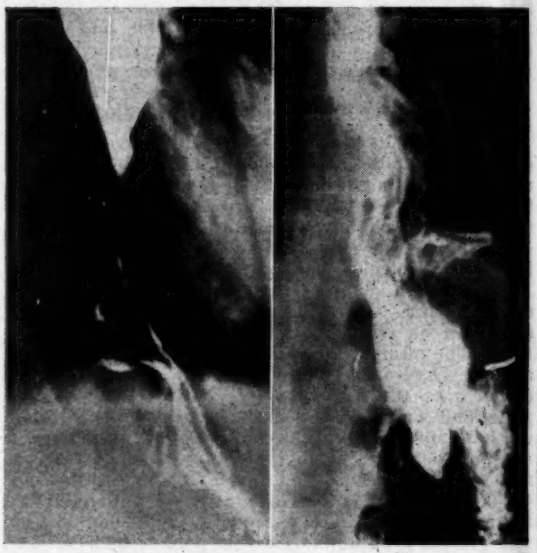
I HAVE chosen this subject, not because I have found the answer to the problem of satisfactory repair, nor because I have much that is new to say, but for two other reasons: firstly, this is an unsolved difficulty and, therefore, the setting-out of different viewpoints sometimes gives a clue to further advance; and secondly, I am in the main tackling the condition from the abdominal end—an approach which is less popular nowadays, but one which has several advantages over the thoracic one.

It is remarkable how hiatus hernia and its complications have become more and more prominent in our operation lists and surgical literature. Undoubtedly, one important reason for this is our increasing knowledge of the effects of the reflux of gastric juice into the gullet; and another reason is the greater accuracy of radiological diagnosis, or perhaps it is more correct to say, the more frequent search by the radiologist for the presence of hiatus hernia or reflux. The endoscopic appearances too are now familiar to the œsophagoscopist—the lax gullet full of gastric juice, the mobile and often patulous cardiac orifice, the congested, bleeding, granular, and sometimes ulcerated or stenosed lower œsophagus.

Despite these things, I believe there may be a real rise in the incidence of œsophagitis. It is, after all, a form of peptic ulceration, and we know how duodenal and gastric ulceration have varied in frequency over the last fifty years. It is possible that, just as the average young man of 1910 was in little danger of his gastric juice ulcerating his duodenum, whereas in 1950 he runs about a 10% risk that this may happen, so the person of 1920 with a hiatus hernia kept an unulcerated œsophagus, whereas in 1950 his risk of ulceration or of œsophagitis is higher.

Indications for Repair of a Hiatus Hernia

The mere discovery of a hiatus hernia with or without reflux is not an indication for surgery in the middle-aged or elderly. In the young, there is something to be said for repair in order to prevent loss of respiratory efficiency and safeguard against œsophagitis. If there are symptoms, most typically heartburn, in the middle-aged and elderly, medical management should first be tried. Reflux is always worse if the intra-abdominal pressure is increased—for example, by obesity or tight corsets. I have even known œsophageal symptoms begin as the result of a chronically over-distended bladder, and they were relieved after prostatectomy. Therefore, the first point in medical treatment is to treat obesity and to advise the patient to avoid tight belts or corsets. This alone may relieve the symptoms. The reduction of weight is also an advantage if surgical treatment should become necessary later on. Stooping should be avoided and the patient should learn to sleep in the sitting-up position. A régime similar to that for peptic ulcer should be followed. In many cases, the patient comes to the doctor because he is worried about the *cause* of his symptoms, and explanation and some simple instruction on how to minimise them will make him completely happy.



(a) (b)

Fig. 1—(a) Preoperative view of hiatus hernia with œsophageal stricture; (b) after resection of the strictured area and upper half of the stomach.

If medical management fails or stenosis, œsophageal ulceration, or bleeding occurs, surgery is indicated. The main indications for surgical treatment are:

(1) Chronic œsophagitis associated with pain, or recurrent bleeding which resists medical management.

* A lecture given to the North of England Surgical Society on April 20, 1955.

DR. CROOKE: REFERENCES—*continued*

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(2) Penetrating ulcer of the œsophagus or severe stricture formation, except in the very aged.
(3) Massive hernia, associated with breathlessness or cardiac embarrassment.
(4) Recurrent gastric obstruction in the sac.
(5) Acute emergencies—e.g., acute intestinal obstruction in the sac, or ulcer perforation.
(6) Association with cardia cancer.

Surgery is also indicated if there is an associated gastric, duodenal, or stomal ulcer or gall-stones. Before surgery is undertaken, it is most important to have a satisfactory radiograph of the lower gullet and also an œsophagoscopy whenever the patient is physically suitable for this examination. It is necessary to find out whether the œsophagus is ulcerated, shortened, stenosed, or fixed, and it is important to measure its length and judge its elasticity.

Surgical Management

Even if operation is decided upon, the presence of a hiatus hernia does not mean that its repair is necessarily the best procedure. For example, if the patient has an active duodenal or stomal ulcer as well as a hiatus hernia and complains of heartburn, it has been my experience that a partial gastrectomy for the ulcer will also relieve the heartburn. In younger and more slender subjects, it is worth repairing the hernia as well, but as many of these patients are elderly or poor operative subjects, it is useful to know that the gastrectomy alone will produce a comfortable patient. If gall-stones are present, cholecystectomy alone will not relieve heartburn. In such cases, hiatus repair is also necessary. If there is an active œsophageal ulcer, then any repair must be carried out transthoracically, for it is possible to perforate the ulcer during the œsophageal manipulation. If there is gross stenosis with shortening of the gullet, I am inclined to believe that the opportunity to prevent reflux by repair of the hiatus is gravely diminished, at any rate in the adult. This is not because fixity or shortening make it impossible to bring the œsophagus down into the abdomen—reduction is in fact often easy—it is because the ulceration has taken place at the exact junction of gastric and œsophageal mucosa and the cardia mechanism is probably irreparably damaged. Hiatus repair will give some success in these cases, but the chances are less. I do not know the ideal procedure in these cases. Resection of the involved œsophagus and œsophagojejunal anastomosis to a Roux loop is a certain method, but too hazardous for the average case. Resection of the stricture

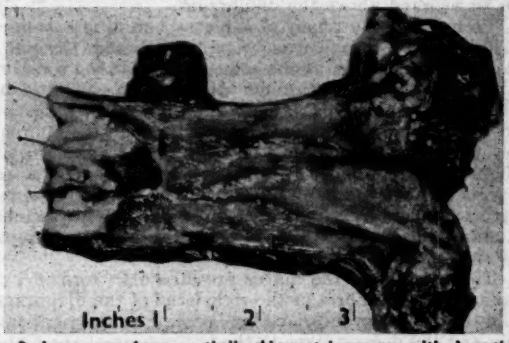

Fig. 3—Lower œsophagus partly lined by gastric mucosa, with ulceration at the junction of gastric and œsophageal mucosa.

and at least the upper half of the stomach with œsophagogastric anastomosis has theoretical disadvantages in that the reflux continues (fig. 1). In practice, I have found it very reliable and an easier and safer operation than a similar resection for cancer, because the fibrotic gullet holds stitches better. I have not found that œsophagitis recurs after the operation. This is the operation I prefer for severe cases in patients who are reasonable surgical risks. In unfit patients, I reduce the gastric acidity by means of a lower partial gastrectomy of the Polya type. If this does not give complete relief, a course of bouginage is instituted, for there is less chance of relapse once the erosive power of the gastric juice is diminished by the partial gastrectomy. This procedure, which was advocated by Wangensteen (1949), does not produce the dramatic improvement of a resection, but over the years a steady improvement occurs (fig. 2).

A word should also be said about ulceration associated with the œsophagus lined with gastric mucosa (Barrett 1950). This should be regarded as a form of true congenital short œsophagus. In the 2 cases of this type which I encountered, there was an undoubted hiatus weakness and reflux of gastric juice into the gullet. The gastric-mucosa-lined lower œsophagus has folds in it which are more prominent than normal œsophageal folds, and puts one on guard (fig. 3). The most satisfactory treatment for this type of case is again resection of the stricture and upper half of the stomach (upper partial gastrectomy). Repair of the weak hiatus would be unlikely to

(a) (b) (c)

Fig. 2—(a) Œsophageal stricture associated with hiatus hernia in 1949; (b) two years after valved Polya gastrectomy; (c) five years after gastrectomy.

cure these patients because peptic juices will continue to be secreted above the diaphragm.

Technically the repair of a hiatus hernia is extremely difficult. The problem is to repair a hernia through a flat sheet of muscle, at the same time retaining a reasonably elastic opening through which the œsophagus and vagus nerves can pass. The hernial margins become distorted and sometimes thinned, and the phreno-œsophageal ligament, an extension of the subperitoneal diaphragmatic fascia on to the lowest œsophagus and cardia, which normally acts as an accessory retentive structure, becomes infiltrated with fat and so stretched and tenuous that it becomes useless as a means of repair of the hernia.

The margins of the hiatus are muscular, formed by a splitting of the fibres of the right crus of the diaphragm, the superficial or anterior fibres passing to the right margin and the deeper fibres to the left margin of the hiatus, though in some 16% of the cases, some fibres of the left crus cross behind the hiatus to reinforce the right margin. There is very little muscle anterior to the hiatus (a maximum of 1·5 cm. of muscle) before the central tendon of the diaphragm is reached. The posterior margin of the hiatus is only 3 cm. above the first visceral branches of the abdominal aorta, and as the crura arise from the lateral surfaces and intervertebral fibrocartilages of the first three or four lumbar vertebræ (Carey and Hollinshead 1955), it is obvious that this part is an abdominal rather than a thoracic structure and, I believe, is most clearly defined from the abdominal aspect. There is no doubt that in the normal subject, the musculature of the hiatus and particularly the phreno-œsophageal ligaments are best seen from the abdominal surface. The latter are particularly obtrusive when they are normal, as seen, for example, during the operation of vagotomy.

I have used both the abdominal and thoracic approaches for operations on œsophageal hiatus hernia and have seen troubles and recurrences after both; but in most cases I elect to use the abdominal approach for a number of reasons.

The Abdominal Approach

Advantages

The first advantage concerns the diagnosis. The degree of herniation can be judged very much more accurately from below than from the thorax, particularly the minor degrees of herniation. In fact, minor degrees of herniation are practically unmeasurable from the thorax, and the surgeon must operate on the strength of his preoperative diagnosis alone. It must also be remembered that opening the thorax removes its negative pressure, and during an intrathoracic operation there is little tendency for the stomach to enter the mediastinum. Consequently, the thoracic surgeon may underestimate the very strong tendency for the stomach to enter the hernial sac, and I have seen what I would consider inadequate operations carried out through the thorax on that account. On exposing a hernial sac from the abdominal aspect, it is remarkable how strong is the pull into the chest. If the stomach is reduced into the abdomen it requires constant firm traction to prevent it from returning into the sac, and one is in no doubt whatever that very firm suturing, both of the hiatus and the phreno-œsophageal ligaments, will be necessary to keep the stomach out of the posterior mediastinum.

The necessity of some form of abdominal approach is tacitly admitted by most thoracic surgeons when they make the approach abdomino-thoracic, or make use of an incision in the diaphragm.

Perhaps more important than diagnosis of the extent of herniation, however, is the diagnosis of accessory conditions. The difficulty of differentiating between the symptoms of hiatus hernia and those of gall-stones, peptic ulcer, and coronary disease are well known. The thoracic approach gives no aid to the diagnosis of coronary disease, but an abdominal one clarifies the diagnosis of biliary and gastroduodenal disease or stomal ulcer and enables these conditions to be treated. I have seen several patients with associated peptic ulcer and hiatus hernia in whom the latter condition was dealt with only through a thoracic incision, and symptoms were little relieved. I find that over 20% of my hiatus-hernia cases need an operation on the gall-bladder or stomach, and usually this operation is more important than the operation on the hiatus. It is true too that many patients with hiatus hernia need an operation on their œsophagus which should be carried out transthoracically, but, provided œsophagoscopy is carried out beforehand (as it always should be) such cases are readily distinguished before operation.

It is true that the approach from the abdomen demands experience in the exposure of the cardia region. It occasionally requires the use of certain expedients to increase the abdominal approach and is somewhat more tiring for the surgeon in obese or otherwise difficult patients. Perhaps one of its greatest advantages, however, is the fact that this operation calls considerably less on the patient's reserves and leads to fewer postoperative pulmonary and cardiac complications than the thoracic approach. As many of these patients are elderly, the easier postoperative course is an important consideration.

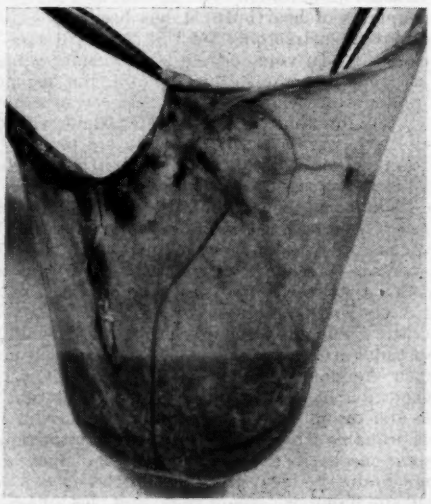

Fig. 4—A hiatus-hernia sac (partially filled with fluid to demonstrate it) removed without difficulty by the abdominal approach.

Disadvantages

The fat patient, and particularly the one who has also retained a strong anterior abdominal wall, increases his abdominal cavity at the expense of his thoracic cavity and the diaphragm rises notably. In some cases the diaphragm appears to bulge upwards behind the heart in a remarkable way, and the gastric fundus and spleen come to lie behind the heart. Although the œsophageal hiatus does not itself rise so much as the central tendon, the operative difficulties are nevertheless greatly increased and the deep chest makes the approach more distant. In such cases it is often wise to decide in favour of a transthoracic route for repair. The raised intra-abdominal pressure so hampers the freedom of the diaphragm, that before operation the patient must reduce his weight to give his diaphragm freedom to descend.

The presence of penetrating ulceration, severe shortening or stricture, or malignant disease in the cardia region are all contra-indications to abdominal repair of a hiatus

TABLE I—COMPARISON OF RADIOLOGICAL AND CLINICAL FINDINGS AFTER OPERATION

Radiologist's report	Clinical findings		
	Satisfactory	Improved	Unchanged
No hernia, no reflux ..	12	..	..
Hernia, no reflux ..	2	3	..
Hernia and reflux ..	1	2	3
Reflux, no hernia ..	1	..	1

hernia and, as I have already said, often contra-indicate attempts at thoracic or any other repair of the hernia.

Repair of the Hiatus Hernia

Approach

The work of Allison and others on the transthoracic approach is well known, so I propose to deal only with the technique for the abdomen. The first requisites are good spot-lighting, good relaxation, and a high-enough incision.

I therefore make a high midline or right paramedian incision. If there is a great depth of subcutaneous fat, it will impede deep retractors and I sometimes remove much of the subcutaneous fat by undercutting along the length of the wound for about 2 in. from each side, so that the skin edge falls down to the level of the anterior rectus sheath.

In most cases it is an advantage to remove the xiphoid process freely. The anterior margin of the diaphragm is then incised upwards and this lets more light into the hiatus region. On rare occasions, in the deep-chested or those with a high diaphragm, it may also help to divide the sternum up and into each 4th intercostal space. The two halves are retracted, the anterior diaphragm is incised further upwards, taking care not to open the pericardium.

After opening the abdomen, the extent of the hernia is investigated. As I said before, the presence of a peptic ulcer affects the nature of the operation considerably, and so a careful general examination must be made.

Next, the left hand is placed with two fingers either side of the left lateral ligament of the liver and this ligament is divided, freeing the liver from the diaphragm, until the left lobe can be drawn downwards and to the right, where it is held by a retractor. A second small retractor is placed in the left side of the wound by the assistant, who then draws the stomach downwards. An incision is made through the peritoneum and stretched phreno-œsophageal ligament at the hiatus level, exposing the œsophagus. At this stage, a bulky sac should be pulled downwards by inserting the fingers on its mediastinal side and it can be rapidly drawn inside out, and cut away with scissors (fig. 4). The gullet is defined and a slender rubber sling is placed round the œsophagus and vagus nerves. Next, I pass a tractor ligature through the anterior part of each margin of the œsophageal hiatus and draw it forwards. The margins are carefully cleaned and stripped of all fatty and loose fascia and peritoneal tissue around each side to the posterior part, where the muscle-fibres can be seen passing around the front of the abdominal aorta. It is sometimes necessary to divide the upper part of the lesser omentum, or hepatogastric ligament, in order to visualise the posterior margin of the hiatus. Having defined the entire circumference in this way, a finger is placed on the superior surface of the margins of the hiatus, and the pleura and pericardium gently eased away from the edge, in order to make it possible to pass stitches through, without damaging the pleura or pericardium.

TABLE II—RESULTS OF OPERATION IN PATIENTS WITH HIATUS HERNIA ALONE

Operation	No. of patients	Operation deaths	Survivors of operation					
			Completed 1 year	Traced	Satisfactory	Improved	Unchanged	Late unrelated deaths
Anterior repair	13	1	12	10	6	..	3	1
Posterior repair	67	..	49	47	31	12	4	..
Posterior imbrication ..	7	..	1	..	..	..	..	..
Posterior repair and pyloroplasty	1	..	1	1	..	1	..	..
Transthoracic repair * ..	7	..	6	5	3	..	2	..
Phrenic crush	4	..	4	4	1	2	1	..
Total	99	1	73	67	41	15	10	1

Satisfactory = No troublesome symptoms.
Improved = Better than before operation but still troublesome symptoms.

* 4 of the patients treated transthoracically had had recurrences following abdominal repair. In 2 of the others an abdomino-thoracic route was used on account of a suspicion of malignancy.

Repair

The stage is now ready for repair. I have tried several methods in the past, mainly using interrupted sutures anterior or posterior, or both anterior and posterior to the gullet. I have, during the past year, mainly been imbricating the right margin over the left one behind the gullet, but lately I have been doing the same thing anterior to the gullet. My overlapping methods are too recent to compare their relative efficiencies. So far as the anterior repair is concerned, it is important to carry the overlapping forward to the fibrous part of the diaphragm; for this means that the approximated muscular margins have their insertions brought together and so there is less distortion of muscle-fibres.

TABLE III—RESULTS OF OPERATION IN PATIENTS WITH HIATUS HERNIA AND STRICTURE OR PENETRATING ŒSOPHAGEAL ULCER

Operation	No. of patients	Operation deaths	Survivors of operation					
			Completed 1 year	Traced	Satisfactory	Improved	Unchanged	Late unrelated deaths
Œsophagectomy	9	1*	7†	7	5	1	..	1
Lower partial gastrectomy	7	1	5	5	3	1	..	1
Posterior repair	6	2	3	3	2	1	..	..
Anterior repair	1	1	..	..	..	..	..	..
Posterior repair, lower partial	1	..	..	..	..	..	..	..
Posterior repair, lower partial, and vagotomy ..	2	..	2	2	1	..	1	..
Anterior repair and lower partial	1	1	..	..	..	..	..	..
Total	27	6	17	17	11	3	1	2

* This patient had a radical operation on an erroneous diagnosis of carcinoma.
† 2 of these have died of unconnected causes but had been assessed a year or more after operation.

I close the hiatus very snugly around the œsophagus. Next I put some stitches of fine non-absorbable material between the fascial tissue round the cardia, and the fascia under the diaphragm. One does not repair the phreno-œsophageal ligament, for this structure is too tenuous and frail to use in most hiatus hernia cases. The object is rather to *replace* the ligament exactly where it should be, by sutures. I have seen these sutures placed an inch or more from the cardia, between the gastric fundus and under-surface of the diaphragm. This is inadequate for they will not prevent a cone of cardiac end of stomach from re-entering the posterior mediastinum. Before drawing these latter sutures tight, there is an important preliminary—namely, to replace gently the œsophagus up into the posterior mediastinum, until the œsophago-gastric angle is correctly restored. If this is not done, then there is a risk that the 1–2 cm. of œsophagus left below the tightened hiatus may be bathed in gastric juice, and as much pain and damage may ensue if 1 cm. is ulcerated, as if the whole gullet were exposed to the action of the acid juice.

It is safe to make the new hiatus fit closely round the gullet, in fact, I believe it is important to do so. Some

temporary dysphagia may result, but there will never be any permanent obstruction so long as the new hiatus margins are of muscle—for, at the worst, these margins can be dilated by passing a small mercury-laden (Hurst) bougie.

Preparation and Aftercare

The most important preparation for these operations is to reduce the weight of obese patients and the most important postoperative care is to keep the weight down. Most patients after these operations should avoid occupations involving prolonged or heavy muscular strain.

Results of Surgical Treatment

The results are difficult to classify. There is, however, one statement commonly made in the past, with which

Fig. 5—Large gastric ulcer and large hiatus hernia in an old woman. If surgery is necessary in such cases, all that is needed is a lower partial (i.e., Billroth I) gastrectomy, removing the ulcer.

I find I must disagree. It used to be said that after operation for hiatus hernia, one should not do a barium meal on the patient again because the patient will be satisfied, but the films will show a recurrence. Now, in our follow-up, carried out by my medical and research colleague, Dr. Brian Swynnerton, we found that the results of X-ray examination tallied closely with the clinical results. Table I shows a number of cases which were examined by the radiologist on their follow-up (this is not a complete follow-up and the percentages are not the total percentages of good and bad results). This table shows that there is a tendency for the X-ray and clinical results to coincide, and it is noticeable that all cases without reflux or recurrent hernia according to the X-ray examination also had satisfactory results.

In view of the associated condition and complications, it is difficult to compress the results of our most recent follow-up. It has been our experience that if there is going to be a relapse, it comes within the first year. We have, therefore, followed up patients operated on more than a year ago. The operations were performed by myself and my assistants in one hospital. Table II gives the results in patients who had a hiatus hernia alone. The posterior repairs produced rather more satisfaction

TABLE IV—RESULTS OF OPERATION IN PATIENTS WITH HIATUS HERNIA AND ULCER OF STOMACH OR DUODENUM

Operation	No. of patients	Operation deaths	Survivors of operation					
			Completed 1 year	Traced	Satisfactory	Improved	Unchanged	Late deaths
Lower partial gastrectomy	8	..	6	6	5	1	..	..
Anterior repair and lower partial	1	..	1	1	1	..	..	..
Posterior repair and lower partial	6	..	2	2	2	..	..	..
Posterior repair, vagotomy, and drainage	9	1	8	8	4	4	..	..
Upper partial and vagotomy	1	1	..	..	..	..	..	..
Total	25	2	17	17	12	5	..	..

In a number of these patients there were no symptoms suggesting œsophagitis.

H.H. +G.U., 7
H.H. +D.U., 13
H.H. +D.U. +G.U., 4
H.H. +duodenal ileus, 1.

than anterior ones. I believe this is, in fact, due to the better dissection round the hiatus, for the anterior repairs were much earlier ones. Phrenic crush was carried out on very feeble patients with symptoms of gastric incarceration in the chest rather than œsophagitis. I realised that the operation does not relax the hiatus itself, and I believe such benefit as it gives is due to elevation of the left diaphragm, thus diminishing the intra-abdominal and increasing the mediastinal pressure and allowing the hernial contents to return more readily to the abdominal cavity.

By "œsophagectomy" (table III) is really meant what I call upper partial gastrectomy—that is to say, a resection of the upper half of the stomach and the gullet, to just above the stricture.

Of the deaths following repair of hiatus hernia, 1 was due to perforation of the œsophageal ulcer, so I do not regard hiatus repair as quite safe for these patients, and nowadays treat the cases by some other means. The death following lower partial gastrectomy (by which is meant a high-Polya type of operation) was due to pulmonary embolism in a rather flabby and very ill patient.

In the group with hernia plus peptic ulcer (table IV) I think gastrectomy is the most important part of the operation (fig. 5). In fit patients, a hiatus repair can be added but some are aged: one was a lady of 84 with a gastric ulcer penetrating the tissues above the diaphragm; she is very well following a simple Billroth-I resection.

It is tempting to do a vagotomy at the time of hiatus repair in the duodenal ulcer cases, but vagotomy has not been so successful as gastrectomy.

Cases with associated gall-stones (table V) need very careful assessment. It is wise to assume that cholecystectomy will not relieve heartburn.

TABLE V—RESULTS OF OPERATION IN PATIENTS WITH HIATUS HERNIA AND GALL-STONES

Operation	No. of patients	Operation deaths	Completed 1 year	Traced	Satisfactory	Improved	Unchanged	Late deaths
Posterior repair and cholecystectomy	11	..	6	6	5	..	1	..

I have included as a matter of interest cases associated with carcinoma of the cardia:

	No. of cases	Resected
Squamous-celled carcinoma	9	4
Adenocarcinoma	16	12
Total	25	16

I have found this association so often that I wonder whether reflux œsophagitis may not be a cancer-provoking lesion. The combination is difficult to recognise radiologically, because the tumour tends to prevent reflux and the hernial sac becomes obliterated with growth.

Conclusion

There are many interesting problems to solve in dealing with hiatus hernia and its complications. How satisfactory is hiatus repair in the treatment of the more advanced cases of reflux œsophagitis? Has the thoracic approach any advantage over the abdominal? Is an œsophagogastric resection necessary in severe cases? Would it not be equally successful merely to transect the gullet above the diseased part and make an anastomosis between the cut end of the œsophagus and a Roux loop of jejunum, leaving the stomach in situ? (I have done this successfully in 1 case.) Is a Polya type of gastrectomy a reliable method of dealing with œsophagitis in cases not complicated by duodenal ulceration?

The answer to all these questions awaits careful documentation of our cases, careful operation, and an unbiased survey of our results.

Figs. 1 and 2 were originally published in my Lettsomian lectures (*Postgrad. med. J.* 1954, **30**, 577).

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SUBACUTE BACTERIAL ENDOCARDITIS IN THE ELDERLY

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WE have recently seen several cases of subacute bacterial endocarditis in the elderly in whom the diagnosis had been missed or delayed. This appeared to be due to three main reasons: (1) it is not generally realised that the disease may occur in this age-group; (2) the disease may be less severe in the aged; and (3) several of the usual criteria are not necessarily found in the aged.

We analyse here the cases diagnosed as subacute bacterial endocarditis in St. Thomas's Hospital in 1946–54, with particular reference to the clinical features present in the patients aged more than 60. During these years there were 76 cases, of which 62 were confirmed by blood-culture or by necropsy. Of the 76 patients 26 died within six months of diagnosis, including a few who died shortly after admission or were not diagnosed until necropsy. We make no comments on therapy, because this is adequately covered in recent reports.

Age-distribution

The age-distribution is shown in fig. 1: as in other series, the maximal incidence occurred in patients aged 40–50 but 14 (18·5%) patients were over 60, 5 of them (6·6%) being over 70. This proportion in the elderly is greater than has previously been reported.

Bayliss (1944) reviewed 41 cases from St. Thomas's Hospital before the penicillin era, and the eldest patient was aged 54; Bruce Perry (1936) analysed the age-distribution in 461 cases reported by Horder (1909) and Thayer (1931) and found that 9% of patients were over 60.

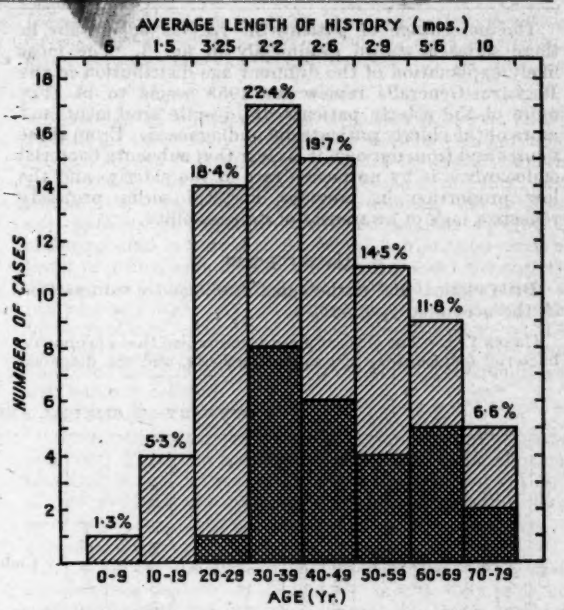

Fig. 1—Age-distribution of cases of subacute bacterial endocarditis at St. Thomas's Hospital in 1946–54: hatched, deaths.

More recently Cates and Christie (1951) have reported the results of penicillin therapy in an M.R.C. trial at many centres and found that only 3% of 408 patients with proved subacute bacterial endocarditis were over 60.

These figures published from hospitals may not reflect the true age-distribution. The Registrar-General's statistical review of deaths for 1931 showed that 13% of patients who died of subacute bacterial endocarditis were over 60 (Perry 1936); and the review for 1953 showed that 28% of all deaths from this disease were in patients over 60. This latter figure does not, of course, reflect the true distribution, because a large number will have been cured, and it may be expected that the cures will be greater in younger patients.

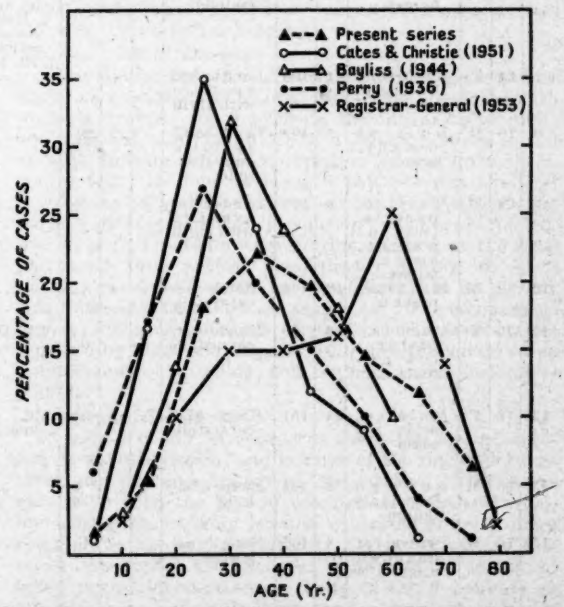

Fig. 2—Comparison of age-distributions found by different workers.

The percentage of patients in various age-groups in these series is shown graphically in fig. 2. The most likely explanation of the different age-distribution in the Registrar-General's review for 1953 seems to be that more of the elderly patients die despite treatment and more of the elderly patients die undiagnosed. From these figures and from our own it is clear that subacute bacterial endocarditis is by no means rare in the elderly, and the low proportion in previous hospital series probably reflects a lack of awareness of its possibility.

Case-reports

Brief clinical and pathological findings are summarised in the accompanying table.

Cases 1–5.—The clinical picture resembled that of subacute bacterial endocarditis in younger patients, and the diagnosis was made reasonably quickly except in case 5, where the delay was entirely the fault of the patient, who stayed away from her doctor for six months.

Case 6.—A man, aged 69, was seen in St. Thomas's Hospital with two months' history of lassitude and low pyrexia. He presented a classical picture of subacute bacterial endocarditis, but his blood-cultures remained negative. He recovered slowly under treatment with large doses of penicillin but had an embolism in his right leg after discharge. He had been transferred from another hospital for investigation, and it is presumed the correct diagnosis had not been made there because it was not considered.

Case 7.—A woman, aged 64, had two years' history of the classical symptoms and signs of subacute bacterial endocarditis, which had been diagnosed elsewhere, but treatment had never been really effective, because she kept relapsing. After penicillin 166 mega units had been given in six weeks she made a complete recovery.

SUMMARY OF CLINICAL AND PATHOLOGICAL FINDINGS

Case no.	Age (yr.)	Sex	Presenting symptoms	Length of history (mos.)	Evening pyrexia	Heart murmurs	Clubbing of fingers	Spleen	Petechiæ	Emboli	E.S.R. (mm. in 1st hr.) (Westergren)	Hb %	White cells (polymorphs %)	Blood-culture	Comments
1	61	F	Pyrexia, painful spots in fingers	2	101	Loud basal systolic and diastolic	..	+	++	Osler's nodes, red cells in urine	32	92	10,600 (77%)	*Strep. viridans*	Known to have had aortic incompetence for several years. Recovery, alive 3 years later.
2	63	F	Malaise after extraction of teeth	3	100	Apical presystolic and basal diastolic	..	..	..	..	25	75	9400 (80%)	*Strep. viridans*	Known to have had mitral stenosis and aortic incompetence. Recovery, lt. calf venous thrombosis during treatment
3	62	M	Loss of weight, anorexia	3	100	Loud apical systolic	+	..	..	Fatal cerebral	..	40	13,500 (85%)	*Strep. viridans*	Died 10 days after treatment began. Cerebral embolus
4	62	M	Lassitude, aches	4	101	Loud apical systolic with thrill	..	+	+	1. Rt. big toe 2. Fatal cerebral	40	72	8800 (87%)	*Strep. viridans*	Died, both emboli occurred during treatment
5	67	F	Dyspnœa, malaise	6	101	Loud apical systolic	+	..	..	Red cells in urine	19	60	5500 (82%)	*Strep. viridans*	Delay in diagnosis because patient did not report to her doctor. Recovery
6	69	M	Lassitude, pyrexia	2	103	Loud apical systolic	..	+	+	1. Red cells in urine 2. Hæmorrhage in retina 3. Rt. leg	..	44	6800 (81%)	Neg.	Diagnosis not proved but seems certain; transferred from another hospital with pyrexia of unknown origin, slow recovery, embolus in rt. leg after discharge
7	64	F	Recurrent bouts of pyrexia	24	100	Loud apical systolic with thrill	+	+	+	..	..	76	10,500 (75%)	*Strep. viridans*	Diagnosis had been made elsewhere but she kept relapsing (9 times) in spite of apparently adequate therapy. Recovery
8	70	F	Loss of weight, malaise	5	102	Loud basal systolic and diastolic	+	..	..	..	56	80	9800 (72%)	*Strep. viridans*	Admitted to surgical ward. ? carcinoma of stomach. Diagnosis not considered until she had an attack of left ventricular failure. Died in hospital from heart-failure
9	63	M	Malaise, pyrexia, loss of weight, heart-failure	6	102	Loud apical systolic with thrill	+	+	+	..	35	63	7700 (72%)	Neg.	Investigated elsewhere. ? chronic urinary infection. Chloramphenicol gave short remission. Died in five months from heart-failure
10	70	M	Malaise, pyrexia	12	100	Harsh apical systolic	+	+	..	..	35	104	8200 (64%)	*Strep. viridans*	Investigated for pyrexia of unknown origin in spite of classical findings. Recovery
11	70	F	Cardiac failure, low pyrexia	6	100	Harsh apical systolic	..	..	..	Rt. thumb	30	80	12,000 (75%)	*Strep. viridans*	Cor pulmonale diagnosed on first admission. Penicillin (one week) gave brief remission. Correct diagnosis not considered until embolus in thumb. Died one year later from heart-failure
12	78	F	Malaise, aches, pyrexia	24	101	Harsh apical systolic	..	..	..	Rt. forefinger	34	82	7100 (66%)	*Strep. viridans*	Admitted with pyrexia of unknown origin, but routine blood-culture was positive after 14 days. Recovery. Embolus during treatment
13	65	M	Severe cardiac failure	3	101	Basal diastolic	+	..	+	..	..	73	3800 (82%)	Not done	Admitted with severe heart-failure. Significance of clubbing and petechiæ not appreciated until necropsy
14	70	M	Pyrexia of unknown origin	8	102	None reported	..	..	..	..	..	68	..	Not done	Persistent pyrexia after catheterisation was thought to be due to pyelonephritis. Died in heart-failure. Correct diagnosis never considered (see text)

Case 8.—A woman, aged 70, complained of lassitude and loss of weight for five months. She was referred to a surgeon and admitted to hospital for investigation of suspected gastric carcinoma. She was not seen by a physician until she had an attack of acute left ventricular failure, whereupon the correct diagnosis was made.

Case 9.—A man, aged 63, complained of malaise, loss of weight, and pyrexia. He was admitted to another hospital under a surgeon for investigation of suspected urinary-tract infection. Nothing abnormal was found in the genito-urinary tract, but chloramphenicol given empirically for ten days abated the pyrexia and temporarily improved the symptoms. After his discharge from hospital the symptoms soon returned, and by the time he was admitted to St. Thomas's Hospital he had signs of mild cardiac failure. He showed classical signs of subacute bacterial endocarditis, but his blood-cultures remained negative. Under prolonged treatment with penicillin the pyrexia abated and his general health improved, but he died in five months from cardiac failure.

Case 10.—A male doctor, aged 70, complained of general malaise for twelve months and pyrexia for at least three months. He was fully investigated elsewhere without a diagnosis being reached. When he came under our care he had classical signs of subacute bacterial endocarditis, blood-culture was positive, and he responded completely to prolonged treatment with penicillin. We felt that the diagnosis would certainly have been made at the other hospital if only it had been considered (the patient had already suggested the diagnosis).

Case 11.—A woman, aged 70, was admitted to St. Thomas's Hospital with mild cardiac failure of three months' duration. She had low pyrexia and a harsh apical systolic murmur, but it was considered that the fever and heart-failure were a result of chronic bronchitis and emphysema. She was given a short course of penicillin and routine treatment for cardiac failure and responded temporarily. After two months she was readmitted with heart-failure and a return of low pyrexia. Shortly after admission she had a painful swelling in her right thumb. It was thought that this might have been due to an embolus; so blood was cultured and found positive. She had no clubbing, an impalpable spleen, and no previous evidence of emboli. She underwent prolonged treatment with penicillin and recovered, but died a year later from cardiac failure. In a younger patient the combination of low pyrexia and a harsh apical systolic murmur would have suggested the correct diagnosis earlier.

Case 12.—A woman, aged 78, complained for two years of vague aches and general malaise which slowly got worse, and it was known that she had had low pyrexia for at least six months before admission. Examination revealed evening pyrexia, a harsh apical systolic murmur, and an easily palpable right kidney, which was thought initially to be enlarged. Blood-culture produced *Strep. viridans*. During treatment with penicillin she had a small embolus in a finger, but she eventually recovered completely and lost all her long-standing pains. Initial investigations were focused on the right kidney, and the correct diagnosis had not been considered before the blood-culture report arrived, though the findings of prolonged pyrexia and a heart murmur would certainly have led to its earlier consideration in a younger patient.

Case 13.—A man, aged 75, complained of increasing dyspnœa for three months, and was admitted with severe heart-failure and gross cardiac enlargement due to aortic incompetence. He also had evening pyrexia, clubbing, and petechial hæmorrhages on his legs. He was severely ill, did not respond to treatment of heart-failure, and died in three weeks. Necropsy showed that he had subacute bacterial endocarditis, which had not been considered during life possibly because of the severity of the heart-failure.

Case 14.—A man, aged 70, was admitted with signs and symptoms due to thrombosis of a posterior cerebellar artery. On admission he was apyrexial, and no heart murmurs were heard. He developed retention of urine requiring permanent catheterisation. Shortly after this pyrexia developed, persisted, and gradually became more severe, until he died six months later. The progressive pyrexia had been ascribed to pyelonephritis, but at necropsy he was found to have subacute bacterial endocarditis of the mitral and aortic valves, and both kidneys contained infarcts, but there was no evidence of pyelonephritis. The notes and investigations were regrettably inadequate, but at no stage was any heart murmur heard. In retrospect it seems probable that bacterial endocarditis developed shortly after catheterisation and remained undiagnosed throughout his long stay in hospital.

Discussion

Although in many respects subacute bacterial endocarditis in the elderly is similar to that in younger age-groups, several features may be different and are worth emphasising. In some cases the disease is in every way similar, the onset being relatively definite, and in 2 of our patients it followed tooth extraction. Pyrexia, clubbing, and a palpable spleen, in conjunction with a heart murmur, soon lead to blood-culture and the correct diagnosis. Evidence of emboli, however, other than a few petechiæ was rare. In other cases the onset is much more insidious: fever and a heart murmur may be the only signs; and, if the murmur is accepted as a common and often insignificant finding in the elderly, the diagnosis will be long delayed.

Sex-distribution

There were 7 men and 7 women in our group of patients over 60. This is in agreement with the sex-distribution found at all ages. Cates and Christie (1951) reported that, of 408 patients who were bacteriologically positive, 202 were males and 206 were females.

Length of History

It is always difficult to say when subacute bacterial endocarditis begins. It is usually taught that it is of insidious onset, but we were impressed, when looking through the notes, by how often patients were able to date the onset to a particular week and often to a day. We have analysed the time from the apparent onset until diagnosis. It naturally varied from patient to patient; but, when an average was taken for each decade, a striking difference was found over the age of 60. The only patient under 10 had a long history of six months, but from then until the seventh decade the highest average was 3·5 months (in the third decade). In the seventh decade it was 5·6 months, and in the eighth 10 months (fig. 1). As already stated, this was found to be due to three factors: (1) the paucity of physical signs; (2) the more insidious nature of the disease in the elderly (2 of our patients having had symptoms for two years); and (3) the frequent delay in diagnosis because the disease had never been considered—5 of our 14 patients were not diagnosed until their second admission or after transfer from another hospital.

Valvular Site of Disease

The valvular site of the disease, judged by the murmurs found on examination, showed differences compared with younger groups. In 9 patients the mitral valve alone was affected, and in all these a loud or harsh apical systolic murmur, often accompanied by a systolic thrill, was noted. In none of these 9 patients was a mitral diastolic or presystolic murmur noted. In 3 patients the aortic valve (aortic diastolic murmur) alone was affected, and in only 1 patient were murmurs heard at the base and apex (this patient was already known to have mitral stenosis and aortic incompetence). In no patient was congenital heart-disease suspected. The comparable figures for acquired heart-disease in the large series reported by Cates and Christie (1951) are 169 mitral valve only, 44 aortic valve only, and 143 both aortic and mitral valves.

Antecedent Heart-disease

In only 2 of our 14 cases was there any known antecedent valvular lesion. and in none of the remainder was there any previous history of rheumatism. The valves may have been the seat of atheromatous degeneration, but this seems unlikely because atheroma is much more common on the aortic valve. It is very striking in this series how high is the incidence of apparently uncomplicated mitral incompetence; none of the 9 patients so affected were known to have had a previous valvular

lesion. It appears that, in the elderly, "virgin valves" are quite likely to be the site of infection. This is in striking contrast to the over-all picture of the disease, for Cates and Christie (1951), summarising the results of the M.R.C. trial on 442 patients, state that "in no case was it thought that a previously normal heart was affected."

Physical Signs

All the patients had pyrexia, usually 100–101°F at night. All had heart murmurs as described above with 1 exception (case 14)—a patient who appeared to acquire the disease after permanent catheterisation in a surgical ward and about whom the notes were regrettably inadequate. Clubbing was present in 7 (50%), and a palpable spleen was noted in 6 (43%).

Evidence of Emboli

Petechiæ were present in 6 patients during life; in 2 of these cases red blood-cells were noted in the urine, and in 1 case retinal hæmorrhages were present. In 1 further case a painful swollen thumb during her second admission led to the correct diagnosis. In 4 patients major emboli were noted after the diagnosis had been made and treatment begun, and in 2 of these they were fatal. Osler's nodes were not noted in any patient before diagnosis and in only 1 afterwards. In 6 patients there was no clinical evidence of emboli before the diagnosis was made.

Blood-culture

Blood-culture was positive in 10 of the 12 cases diagnosed during life, and *Strep. viridans* was present in all. In 1 case the culture plate was not positive until fourteen days after inoculation. The erythrocyte-sedimentation rate (Westergren) was raised in the 8 cases in which it was estimated (range 19–56 mm. in 1st hour).

Foci of Infection

In 2 patients the disease followed the extraction of teeth, and in 1 it followed permanent catheterisation; in 1 it is said to have occurred after "influenza," but this may well have been the onset of the disease. 2 males had symptoms of prostatic enlargement, and 1 subsequently had a successful prostatectomy.

Heart-failure

Heart-failure was present in 3 patients at the time of diagnosis, and they all died within a year. The 2 patients who died undiagnosed also had severe heart-failure. This is clearly a most important prognostic sign because, so far as we know, none of the survivors has subsequently developed heart-failure.

Summary

76 cases of subacute bacterial endocarditis were seen in St. Thomas's Hospital in 1946–54. 14 (18·5%) were over 60, and their clinical features are analysed.

The disease is not uncommon in the elderly, but the diagnosis is often missed because it is not considered.

In comparison with younger patients the disease may be more insidious in onset; and evidence of emboli, other than a few petechiæ, is unusual. In 9 of the 14 cases the mitral valve alone was affected, and none of these was known to have had previous valvular disease.

A heart murmur, particularly a loud apical systolic murmur, in association with pyrexia should always lead to a consideration of the diagnosis of subacute bacterial endocarditis.

We thank the physicians of St. Thomas's Hospital for permission to report their cases.

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EARLY DIAGNOSIS OF SUBACUTE BACTERIAL ENDOCARDITIS

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THE diagnosis of subacute bacterial endocarditis in its early stages, which is of great importance, presents many difficulties. Patients continue to be referred to hospital at a comparatively late stage of this illness. Although the early symptoms may appear trivial they usually cause the patient to seek medical advice, and most patients have had medical attendance from an early stage of their illness (Jones et al. 1947). Widespread recognition of the early symptoms of this illness, particularly in general practice, should be an important factor in reducing its mortality.

Subacute bacterial endocarditis is relatively uncommon. About 5 cases are admitted to this hospital each year. There is little opportunity to acquire experience of the disease in general practice, and knowledge of its symptoms has at present to be obtained from relatively advanced cases admitted to hospital.

Classical descriptions of subacute bacterial endocarditis, such as those of Horder (1909, 1926) and Libman and Friedberg (1941), are well known. More recent accounts have been given in connection with penicillin trials (Matthew and Gilchrist 1948, Cates and Christie 1951). I present here a study of a small series of cases admitted to a general hospital, and I have tried to emphasise the clinical features which may be of value in the recognition of early cases in general practice.

Material

The series consists of 65 cases of subacute bacterial endocarditis admitted to hospital during the nineteen years from 1936 to 1954. It includes all the cases admitted to Addenbrooke's Hospital during this period and 2 cases from other sources. In every case either the diagnosis was confirmed post mortem or positive blood-cultures were obtained in life. 24 patients, admitted since 1949, had been under my personal observation. 30 patients had been treated with adequate courses of penicillin or other antibiotics, and two-thirds of these were alive at the time of writing. The average duration of symptoms, before admission to hospital, was ten weeks (range 1–31 weeks). Most of the patients had received medical attention from an early stage of their illness.

Sex and Age

In the M.R.C. series (Cates and Christie 1951) the sexes were affected almost equally. In earlier series a preponderance of male patients was a common finding. Two-thirds of the patients in this series were male (table I).

Past History

A past history of either heart-disease or rheumatic fever was obtained in 35 cases (54%). 26 patients (40%) gave a past history of heart-disease, which had usually been well compensated; about two-thirds of these had

TABLE I—AGE AND SEX DISTRIBUTION IN 65 CASES

Age (yr.)	Male	Female	Total
Under 5	0	0	0
6–10	2	0	2
11–20	6	3	9
21–30	9	6	15
31–40	8	4	12
41–50	6	3	9
51–60	5	2	7
61–70	6	4	10
Over 70	1	0	1
Total ..	43	22	65

had no symptoms or only slight incapacity, and the remainder only moderate incapacity. None of the patients were known to have had congestive heart-failure or established auricular fibrillation before the onset of their illness.

A history of dental extraction shortly before the onset of illness was noted in 11 cases (17%). This history or the presence of dental sepsis on admission was noted in 28 cases (43%).

The association of the disease with pregnancy is important and was found in a third of the 12 cases which occurred among women of childbearing age in this series. Symptoms in these patients may easily be attributed to pregnancy or to the puerperium and their true significance missed. The following case illustrates the importance of being on the look-out for evidence of this disease in pregnant women:

A woman of 20, who had been known to have aortic incompetence and mitral stenosis for several years, complained of vague symptoms of ill health during the last month of her second pregnancy. Pyrexia was not discovered until after the birth of her child, when examination showed well-developed signs of subacute bacterial endocarditis. Blood-cultures grew non-hæmolytic streptococci.

Subacute bacterial endocarditis occurs at all ages but is rare in children under 5 years (Rost and Fischer 1928). Most cases occur in young adults. In the present series 27 patients (42%) were aged 20–40. The youngest patient was a boy aged 8 years. The disease is not rare in elderly patients, in whom it appears to be becoming more common. 11 patients (17%) in this series were over 60, 10 of them being among 26 patients admitted since 1949.

The oldest patient in the series was a man of 81. This case illustrates the insidious course of the disease and the difficulties of diagnosis in elderly patients. The patient's illness appeared to follow a fall from a bus ten weeks before admission. His only symptoms were slowly progressive weakness and mental confusion. On admission he had early finger clubbing, petechiæ, a soft apical systolic murmur, and auricular fibrillation. He had irregular pyrexia which was never above 99·6°F. Three blood-cultures grew *Streptococcus fæcalis*.

Symptoms

In about four-fifths of the cases the course of the illness was characterised by remissions and exacerbations. The following history is that of a fairly typical case:

A gardener, aged 30, became ill five months before admission to hospital. His first symptom was an attack of "flu." He was not quite well when he returned to work two weeks later, and in a further two weeks had a second attack. Two days later he had transient aphasia. He began to notice night sweats, loss of appetite, and loss of weight, and these symptoms persisted until admission to hospital sixteen weeks later. He was off work three weeks. Two weeks after return to work a sudden pain in his left foot again forced him to lie up. He then returned to work until two weeks before admission. During this time he felt generally unwell and noticed occasional tender red spots on his fingers. He was finally admitted as a case of nephritis with loin pain and frank hæmaturia. He was found to have classical signs of subacute bacterial endocarditis. Blood-culture on each of the first three days in hospital grew *Strep. viridans*.

In a smaller number of cases, particularly in older patients, the disease follows a steadily progressive course with general symptoms of ill health only.

A woman of 65 was ill for nine weeks before admission with symptoms of weakness, loss of appetite, occasional retching, and progressive loss of weight. On admission she had pyrexia (103°F) which had not been suspected before, her spleen was palpable, petechiæ were present, she had a loud apical systolic murmur, and blood-cultures grew *Strep. viridans* on several occasions.

A wide variety of diagnoses may be made in subacute bacterial endocarditis. Sometimes the symptoms are serious enough to cause admission to hospital, but often they are thought to be due to relatively minor conditions such as "flu," "gastric flu," fibrositis, sinusitis, anæmia, pyelitis, and "nervous breakdown."

TABLE II—SYMPTOMS BEFORE ADMISSION TO HOSPITAL IN 65 CASES

(Figures in parentheses refer to symptoms at onset)

Symptom	No. of cases	Total %
Febrile	49 (32)	75 (49)
Toxæmic	51 (38)	79 (59)
Gastro-intestinal	40 (16)	62 (25)
Cardiac	30 (14)	46 (22)
Mental	13 (9)	20 (14)
Embolism and Osler's nodes	36 (10)	55 (15)
Joint pains	10 (5)	15 (8)
Hæmorrhage	10 (3)	15 (5)

In the present series the symptoms which occurred at onset and during the whole period before admission to hospital (table II) have been classified into groups similar to those used by Cates and Christie (1951). General constitutional symptoms of pyrexia or of toxæmia were most common, and each was noted in about three-quarters of the cases. These were also the most common symptoms at onset.

Febrile symptoms included pyrexia (24 cases: 37%), sweats (34 cases: 52%), chills (11 cases: 17%), rigors (4 cases: 6%), and attacks of "flu" (15 cases: 23%). Toxæmic symptoms were general ill health (23 cases: 35%), weakness (19 cases: 29%), tiredness (19 cases: 29%), pallor (10 cases: 15%), and loss of weight (38 cases: 59%). Loss of appetite (35 cases: 54%) was the most important of the gastro-intestinal symptoms; others were nausea or vomiting, epigastric discomfort, diarrhœa, and constipation. Breathlessness on effort (24 cases: 37%) and swollen ankles (14 cases: 22%) were the most important cardiac symptoms.

Mental symptoms were prominent in 20% of the cases and were variously described as "nerves" or a "nervous breakdown," depression, fits of weeping, or "collapse." The similarity of many of the symptoms of the disease to those in functional complaints is often a cause of difficulty in diagnosis, particularly in these cases. One patient was nearly referred to a psychiatrist:

A man of 53 became ill, six months before admission, with symptoms of increasing tiredness and depression. Two months later he collapsed and was put to bed with a "nervous breakdown." He became increasingly weak and would have fits of weeping, especially when talking to strangers. He took to bed a month before admission and "felt no good" when he tried to get up. Other symptoms were present, but their importance escaped recognition because of the predominant mental symptoms.

Loss of appetite, loss of weight, and sweats, particularly night sweats, were common and often prominent symptoms. One or more of these three symptoms were found in four-fifths of the cases.

Either symptoms of embolism or Osler's nodes (table III) were noted by 36 patients (55%), but by only 10 patients (15%) at onset. Osler's nodes were noticed in 12 cases (18%). A history of Osler's nodes was of great diagnostic value but was easily missed unless a history of pains in the fingers was deliberately sought by the observer. This history was obtained in 9 (38%) of the 24 cases examined personally. The symptom was sometimes early:

A woman of 67 was admitted for the investigation of pyrexia of unknown origin of six week's duration. The only physical signs were those of mitral stenosis. Blood-cultures

TABLE III—SYMPTOMS OF EMBOLISM AND OSLER'S NODES IN 65 CASES

(Figures in parentheses refer to symptoms at onset)

Symptoms	No. of cases	Total %
Osler's nodes	12 (2)	18 (3·0)
Definite embolic symptoms	14 (1)	22 (1·5)
Indefinite embolic symptoms	22 (9)	34 (14·0)

grew *Strep. fæcalis* on two occasions. After the diagnosis was made, careful inquiry revealed that she had noticed transient tender red spots on her fingers at an early stage of her illness.

The embolic symptoms could be divided into definite and indefinite. Definite embolic symptoms were noted in 14 cases (22%) and were rare at the onset of the disease. Cerebral emboli were noted in 4 cases (6%) and renal and splenic emboli in 1 case each. 6 patients (9%) described symptoms of small embolic episodes in the limbs. Of the 6 patients with congenital heart-disease 4 described symptoms of pulmonary embolism.

The more common embolic symptoms, particularly at onset, consisted of pain only and have been called indefinite because they were not characteristic of embolism in themselves. The pain occurred in the back in 11 cases (17%), in the chest in 6 cases (9%), in the abdomen in 6 cases (9%), and in the limbs in 5 cases (8%). These pains varied in character and severity and were liable to be confused with many other conditions, in particular lumbago, fibrositis, and sciatica. Although a common cause of diagnostic error they were, in fact, a most significant feature of the illness. A typical case in which pain was a prominent symptom follows:

A woman of 67 became ill suddenly, twenty-three weeks before admission, with a severe pain in the middle of the back which lasted three weeks and was so bad that she could not walk. The pain disappeared but left her feeling unwell. Two weeks before admission she developed a further attack of pain, this time in the left flank.

Joint pains indistinguishable from those of rheumatic fever were noted by 10 patients (15%). Hæmorrhage, usually frank hæmaturia, was noted by 10 patients (15%). Profuse hæmaturia may be a prominent symptom and liable to cause confusion in diagnosis. Other symptoms recorded included cough, headache, hæmoptysis, epistaxis, melæna, skin rashes, and amenorrhœa.

Physical Signs

The number of cases in which physical signs of subacute bacterial endocarditis were found is shown in table IV. The figures given refer to signs found during the first week after admission to hospital only. The frequency of the signs is shown for the whole series of 65 cases. For comparison their frequency is shown in the 24 personally observed cases and in the 22 cases in which the duration of illness before admission to hospital was six weeks or less.

In the whole series one or more of the classical signs (embolism, Osler's nodes, petechiæ, café-au-lait complexion, clubbing, and palpable spleen) were found in most cases; but in 13 cases (20%), including 3 of the cases under personal observation, a heart murmur and pyrexia were the only physical signs of the disease during the first week in hospital. There were 22 cases with a duration of illness of six weeks or less on admission; 10 of these (45%), including 3 of the 6 under personal observation, showed no physical signs except a heart murmur and fever within a week of admission.

TABLE IV—PHYSICAL SIGNS WITHIN ONE WEEK OF ADMISSION

Sign	Cases of average duration 10 weeks		Cases of duration 6 weeks or less		Personally observed cases	
	No. of cases	%	No. of cases	%	No. of cases	%
Heart murmur	63	97	20	91	24	100
Pyrexia	60	92	20	91	24	100
Embolism	23	35	5	23	11	46
Osler's nodes	7	11	2	9	4	17
Petechiæ	22	34	5	23	13	54
Café-au-lait complexion	25	38	6	27	12	50
Clubbing	27	42	6	27	16	67
Palpable spleen	26	40	5	23	13	54
Heart murmur and pyrexia only	13	20	10	45	3	13
Petechiæ, Osler's nodes, and/or embolism	38	59	9	41	18	75
Total cases	65		22		24	

A heart murmur was present within a week of admission in 63 cases (97%). 1 of the 2 patients with no heart murmur was extremely ill, and disease of the pulmonary valve was found post mortem. The other developed signs of aortic incompetence two weeks after admission. In a further 2 cases the murmur did not at first show typically organic qualities.

A mitral systolic murmur was the only murmur heard in 26 cases (40%) and was thought to be due to mitral incompetence. In contrast, signs of solitary mitral stenosis were found in 2 cases (3%) only. Signs of aortic incompetence were found in 24 cases (37%) and were usually combined with signs of mitral-valve disease; aortic stenosis was also present in 5 of these cases but never as the predominant lesion. Signs of aortic stenosis alone may have been present in 1 case, but the evidence was inconclusive. Signs of congenital heart-disease were found in 6 cases (9%). 4 patients were thought to have a ventricular septal defect, and 1 a patent ductus arteriosus (see table V).

Signs of congestive heart-failure were present on admission in 7 cases (11%). Auricular fibrillation was present on admission in 3 cases (5%). In 5 cases (8%) auricular fibrillation developed some time after admission, but in 4 of these it was paroxysmal and not confirmed by electrocardiography. The blood-pressure on admission was never significantly raised except in cases of severe aortic incompetence. In 54 of 62 cases (87%) it was below 160/90 mm. Hg. Pericardial friction was heard in 2 patients only: 1 of these was moribund, and the other had associated nephritis.

TABLE V—CARDIOVASCULAR SIGNS IN 65 CASES ON ADMISSION

Cardiovascular sign	No. of cases
Mitral systolic murmur only	26 (40%)
Mitral systolic and diastolic murmur only	4 (6%)
Mitral stenosis only	2 (3%)
Aortic incompetence	24 (37%)
Aortic stenosis without incompetence	1 (2%)
Congenital heart-disease	6 (9%)
No heart murmurs	2 (3%)
Total	65

Twice-daily temperature records showed pyrexia during the first week in hospital in 59 cases (91%). Short apyrexial periods were present during this week in about a third.

6 patients (9%) were completely apyrexial during the first week in hospital. 4 of these were terminal cases, 1 had severe nephritis, and the remaining 1 had been treated with penicillin immediately on admission. Inadequate courses of penicillin were also an important cause of temporary remissions of pyrexia in several other cases.

It should be emphasised that the physical signs enumerated in table IV were found during the patient's first week in hospital only, usually on the first clinical examination. Signs of embolism were noted in 23 cases (35%). Splenic embolism was most common (9 cases), but the signs of this condition were often equivocal. Cerebral embolism occurred in 6 cases and was often fatal. The symptoms were those of subarachnoid hæmorrhage or meningitis in 3 patients, of whom 2 died shortly afterwards, and of hemiplegia in the remaining 3.

More valuable signs in diagnosis were small embolic episodes in the limbs. They occurred in 5 cases and consisted of sudden pain in the limb, associated with small erythematous or hæmorrhagic areas in the nearby skin. These lesions, although similar to Osler's nodes in some ways, were usually single, larger, and more persistent. In 1 case a mycotic aneurysm of the radial artery developed.

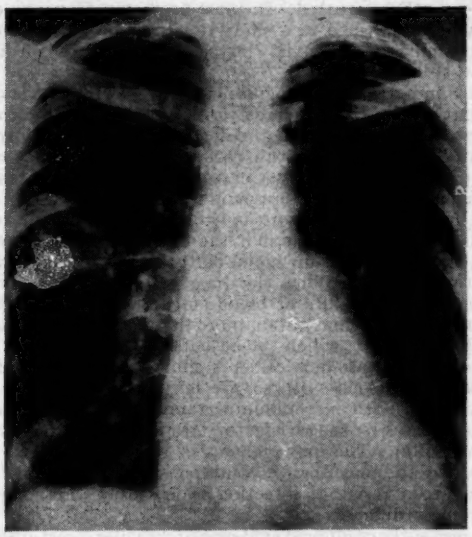

Fig. 1—Subacute bacterial endocarditis showing infarct in right lung from pulmonary embolism in a woman, aged 40, with patent ductus arteriosus.

Embolism of the larger arteries, with ischæmic changes or gangrene of the limb, was never seen.

Pulmonary embolism, characterised by pleuritic pain, pyrexia, and hæmoptysis, usually in recurrent attacks, was an important diagnostic feature on admission in 4 of the 6 patients with congenital heart-disease (fig. 1). Pulmonary embolism was uncommon in the patients with acquired heart-disease. Only 6 patients with signs of disease of the aortic or the mitral valve developed symptoms suggesting pulmonary embolism at any time in hospital. In 5 of these cases the symptoms consisted of left lower chest pain and may have been due to splenic and not pulmonary embolism.

Osler's nodes were seen in 7 cases only (11%). Petechiæ were seen in 22 cases (34%). They were cutaneous in 19 (29%), conjunctival in 14 (22%), retinal in 10 (15%), mucosal in 7 (11%), and under the nails as splinter hæmorrhages in 4 (6%). The petechiæ were occasionally white-centred. Confluent petechiæ (purpura) were noted in 6 cases (9%). The conjunctiva of the lower eyelid was found to be a common site of petechiæ and one in which they were easily detected (fig. 2). Splinter hæmorrhages were relatively uncommon and were easily confused with the small brown streaks often seen in the nails of healthy patients. The detection of petechiæ requires a careful day-to-day search. Petechiæ were found in half the personally observed cases within a week of admission.

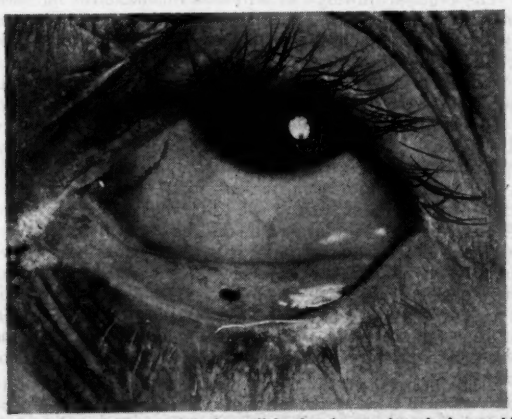

Fig. 2—Subacute bacterial endocarditis showing conjunctival petechia in a man, aged 59, with mitral incompetence.

A café-au-lait complexion was noted in 25 cases (38%) and pallor of the skin in 52 cases (80%). Clubbing of the fingers was seen in 27 cases (42%), but in over half of these an early stage of clubbing only was present. This stage of clubbing, aptly described as "pink clubbing" (Matthew and Gilchrist 1948), is often equivocal unless it is progressive or can be seen to retrogress with successful treatment. The spleen was palpable in 26 cases (40%). The degree of splenic enlargement was usually slight and sometimes transient. Occasionally gross enlargement was present, and in 1 case the spleen weighed 675 g. post mortem.

Investigations

The results of blood-culture are shown in table VI. Positive blood-cultures were obtained in 52 (93%) of the 56 cases in which blood-cultures were taken, and in 46 (82%) at the first attempt. Negative blood-cultures only were obtained in 4 cases, but in 3 of these only one blood-culture had been made.

There was only 1 case with three persistently negative blood-cultures, but cases of this type were excluded by the method of selection unless a necropsy had been done. 3 cases with persistently negative blood-cultures, in which the diagnosis appeared certain on clinical grounds only, were seen at the same time as the personally observed cases but not included in the series. If these cases had been included, the proportion of cases with persistently negative blood-cultures would have been about 10% in the personal series.

TABLE VI—RESULTS OF BLOOD-CULTURE IN 56 CASES

Organism grown	No. of cases
Strep. viridans	39 (70%)
Non-hæmolytic streptococcus	5 (9%)
Strep. faecalis	4 (7%)
Micro-aerophilic streptococcus	1 (2%)
Hæmophilus influenzæ	2 (3%)
Staph. albus	1 (2%)
None	4 (7%)
Total	56

Anæmia was present in 46 (88%) of 52 cases within two weeks of admission. In 21 (40%) the hæmoglobin was less than 10 g. per 100 ml. In 23 of 40 cases (58%) there was a low colour-index (mean corpuscular hæmoglobin less than 27 μμg.). A neutrophil polymorph leucocytosis (5000 or more per c.mm.) was present within two weeks of admission in 38 (83%) of 46 cases and was severe (more than 7500 per c.mm.) in 27 (59%). The total leucocyte-count was raised (over 9000 per c.mm.) in 31 of 50 cases (62%). The erythrocyte-sedimentation rate (E.S.R.) within two weeks of admission, by the Westergren and Wintrobe methods, was unequivocally raised in 27 out of 28 cases.

Albuminuria was present on admission, at routine testing, in 23 cases (35%) and was sometimes severe. Microscopy of the urine showed a definite excess of red blood-cells in 18 of 48 cases (38%) on the first examination within two weeks of admission. 7 of these had hæmaturia obvious to the naked eye.

Discussion

The most common cause of delay in diagnosis in the present series was the similarity of the symptoms of subacute bacterial endocarditis to those of every day illnesses. As a result the early symptoms were easily mistaken for "flu" or some other common disease. Subacute bacterial endocarditis will only be detected in its early stages if its possibility is constantly borne in

mind. There are many symptoms which should excite suspicion of its presence. Persistent pyrexia or ill health is the most important. Others are recurrent attacks of "flu," persistent loss of weight, anæmia, attacks of fibrositis or of pain, rheumatic fever not responding to salicylates, hæmaturia, recurrent attacks of pleurisy from pulmonary embolism, and cerebral embolism.

Many other diseases are commonly associated with these symptoms, but the cases in which subacute bacterial endocarditis is likely can usually be distinguished from the remainder by the presence of a heart murmur. A heart murmur is almost constantly present in subacute bacterial endocarditis. It is usually loud and obviously associated with valvular disease In most cases signs of solitary mitral incompetence or of aortic incompetence are present. In a few cases (about 9% in this series) congenital heart-disease is found. Signs of pure mitral stenosis are rare (Fulton and Levine 1932) and were rare in this series. Aortic stenosis without incompetence was also rare.

There are other cardiovascular signs in this condition which may also be helpful in diagnosis. These have been discussed by Fulton and Levine (1932). Congestive heart-failure is relatively uncommon and was present on admission in only 11% of this series. Auricular fibrillation is perhaps not so rare as it was once thought (McDonald 1946) but is uncommon and was present on admission in only 5% of the present cases. None of the patients in this series appeared to have had established auricular fibrillation or congestive heart-failure before the onset of their infection. Hypertension is uncommon, unless associated with free aortic regurgitation, and was not found, with this exception, in any patient in the series. A pericardial friction rub is also rare. Gangrene or major arterial embolism in the limbs was never found in this series and is rare in this disease (Horder 1926). Pulmonary embolism was also rare in this series except with congenital heart-disease, in which it was common.

In addition to a heart murmur, pyrexia is present in nearly all cases. Isolated thermometer readings may be apyrexial, but a short period of observation with twice-daily readings should show pyrexia in most cases unless they are terminal or the patients have recently been given penicillin. Pyrexia and a heart murmur are the fundamental signs in diagnosis. The occurrence of persistent unexplained pyrexia in a patient with a heart murmur is in itself strong evidence of subacute bacterial endocarditis.

In suspected cases the clinical history and physical examination will usually provide further evidence. Careful questioning is needed to obtain a reliable history, because these patients often do not mention significant symptoms unless asked about them. In particular, patients should be asked about recent dental extraction, unusual pains, pain in the finger-tips, loss of appetite, loss of weight, and night sweats. A systematic physical examination is also important. Physical signs of the disease will usually be found except in very early cases. Many of the signs —e.g., petechiæ, small embolic lesions, Osler's nodes, and sometimes a palpable spleen—are transient, and day-to-day examination is advisable. Even a brief daily inspection of the conjunctivæ and the inside of the mouth, and of the fingers, will often reveal important signs, particularly petechiæ, at these sites. Further help in diagnosis may be obtained by examining the urine, making a full blood-count, and determining the E.S.R. These relatively simple investigations are useful both in excluding diseases likely to be confused with subacute bacterial endocarditis and providing corroborative evidence of its presence. The almost invariable rise in E.S.R. is particularly useful in excluding functional complaints.

Cases of subacute bacterial endocarditis can usually be recognised and doubtful cases reduced to practical numbers by simple clinical methods. Further investigation should probably be done in the hospital where the patient will be treated. In most cases the diagnosis can then be established in a short time on the presence of a heart murmur, pyrexia, physical signs, and positive blood-cultures.

It is important to recognise cases in which pyrexia and a heart murmur are the only physical signs; such formed about 20% of this series and may be expected to form a greater proportion in the early stages of the disease. They formed 45% of the cases with a relatively short duration of illness. Supporting evidence will often be obtained from the history or from physical signs which develop at a later stage, but the diagnosis in these cases will largely depend on blood-cultures and the exclusion of other diseases. When the diagnosis depends to a great extent on the results of blood-culture, it is particularly important to try and obtain more than one positive result.

The cases in which blood-cultures are persistently negative may produce difficult clinical problems. Diagnosis when blood-cultures are negative can usually be established with reasonable certainty by exclusion, and in most cases by the satisfactory response to a trial course of penicillin. The management of these cases when the response to penicillin in usual doses is unsatisfactory owing to a resistant infection is less easy and may be extremely difficult.

Cases without clinical evidence of valvular heart-disease constitute a special problem. Their early recognition and treatment in the hope of preventing further valvular damage is particularly important. At present these cases are rare, but the possibility that they may be commoner in the early stages of the disease should be considered. The diagnosis, in the absence of a heart murmur, may easily be missed, especially if pyrexia is not suspected. When pyrexia is present but there is no evidence of valvular disease, bacteræmia may be diagnosed, but it may be difficult to prove bacterial endocarditis. This is illustrated by the following case, which was excluded from the present series because the infection was acute rather than subacute.

A woman of 50, previously well, became suddenly ill with a rigor. She had a swinging temperature up to 103°F. Clinical examination showed no abnormality. No heart murmur or evidence of heart-disease was found. Blood-cultures grew coagulase-positive *Staph. aureus*. Short courses of penicillin and, later, aureomycin were followed by relapse, but the infection was eventually controlled by a long course of penicillin (84 mega-units in six weeks). Careful observation showed no evidence of heart-disease until the seventh week of illness, when an organic systolic murmur gradually developed at the left sternal edge. No other signs of bacterial endocarditis were noted during her illness.

Summary

The clinical findings in 65 cases of subacute bacterial endocarditis admitted to hospital between 1936 and 1954 are described. 24 of the cases were seen personally.

Although these patients were admitted to hospital at a relatively late stage of their illness, this was usually not due to their failure to obtain early medical advice.

The importance of recognising the early symptoms of the disease in general practice is emphasised, and these symptoms are described.

A heart murmur was present in 97% and pyrexia in 92% of these cases during the first week after admission. These are the fundamental findings in diagnosis. A careful clinical history and physical examination will usually provide further evidence of the disease except in very early cases.

In 20% of the cases and 45% of those with a duration of illness of six weeks or less pyrexia and a heart murmur were the only physical signs within a week of admission.

I thank Sir Lionel Whitby, regius professor of physic in the University of Cambridge, for permission to publish this paper, which is based on a thesis for the degree of M.D. at Cambridge University; Dr. Leslie Cole, Dr. Laurence Martin, and

Dr. A. P. Dick for permission to publish their cases, particularly Dr. Cole for much helpful encouragement and advice; Dr. M. H. Gleeson-White and Dr. J. Marks for permission to publish the laboratory findings and for advice; Dr. F. R. Berridge for permission to reproduce the X-ray film; and Mr. A. Graham for the other photograph.

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CHLORPROMAZINE IN THE MANAGEMENT OF TETANUS

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RECENT work on the treatment of tetanus has centred on the control of spasm by sedatives and by muscle relaxants, including a combination of mephenesin and phenobarbitone (Godman and Adriani 1949) intravenous mephenesin (Smith 1953), gallamine triethiodide ('Flaxedil') (Smith and Thorne 1952), and succinylcholine (Woolmer and Cates 1952). This work has clearly shown that where sedation is deep, and muscle relaxants are pushed till spasm ceases, there is lack of laryngeal control, breathing may be obstructed, and tracheotomy is generally needed. Forrester (1954), following the methods introduced by Scandinavian workers for the treatment of bulbar poliomyelitis (Lassen 1953, Lassen et al. 1954), treated a case of severe tetanus by continuous intravenous infusion of succinylcholine, combined with artificial ventilation through a tracheotomy tube with oxygen and nitrous oxide. The bronchi were aspirated hourly.

Such methods can be practised only in large and specialised hospitals, nor are they necessary for every case of tetanus. In East Africa tetanus is not uncommon; some 20–30 cases are admitted annually to Dar es Salaam hospitals. These unfortunate patients may have to be nursed in the noise and bustle of a general ward, and the close supervision needed to ensure adequate doses of sedative drugs is not generally feasible. In addition to the basic treatment with antitetanic serum and antibiotics, various sedatives have been used, including paraldehyde, pentobarbitone sodium, phenobarbitone sodium, and even morphine. Of the muscle relaxants tubocurarine proved too drastic, while mephenesin, though useful in full dosage, was often discontinued by the ward staff just when it was producing an effect.

Method and Results

Chlorpromazine hydrochloride ('Largactil') is believed to be an antagonist to some central convulsant drugs, and to potentiate the action of hypnotics. Because of these two actions we have administered it, in combination with phenobarbitone sodium or chloral hydrate, in six cases of tetanus.

Chlorpromazine was administered in doses of 50 mg. intramuscularly (diluted to 10 ml.) or intravenously (diluted to 20 ml.). After such a dose the tetanic spasm was dramatically relieved; the abdominal and back muscles were moderately or completely relaxed, convulsive seizures were inhibited, and a lazy sleepiness replaced the anxious tension of the disease. This effect was prolonged for up to twelve hours by simultaneous injection of phenobarbitone sodium gr. 3. Chlorpromazine 25 mg. or 10 mg. by mouth had a less dramatic effect, but proved useful in weaning the recovering patients from the injections.

Insufficient cases have been treated to show whether chlorpromazine reduces the mortality from the disease. But there is no doubt that it spares the patients much of the acute mental anxiety and physical pain and exhaustion due to the spasms; and the régime does not make inordinate demands on the medical and nursing staff.

Illustrative Case-records

Case 1.—African man, aged about 30, was admitted to hospital in the morning complaining of stiffness of the neck and inability to open his mouth since the previous day; he had also had spasms. There was no history of injury or abrasion, nor were any noted on examination. He had pronounced neck rigidity, and was unable to open his mouth. His abdomen and back muscles were rigid, and he had frequent convulsive spasms of the muscles of the face and neck. Tetanus antitoxin 10,000 units was given at once, and penicillin 500,000 units twice daily prescribed. To control the spasm 50 mg. of chlorpromazine was given by slow intravenous injection. Very soon afterwards his abdomen became soft and he could open his mouth, though his neck remained stiff. Phenobarbitone sodium gr. 3 was also given and repeated that evening. The spasms were well controlled during the day, but had returned by next morning when a further 50 mg. chlorpromazine intravenously and phenobarbitone sodium gr. 3 intramuscularly were administered; the phenobarbitone sodium was repeated six-hourly. Again his pain, spasms, and anxiety were satisfactorily controlled during the day, but he unfortunately died in the early hours of the next morning.

Case 2.—An African man, aged about 45, was brought to hospital complaining of fever, aching pains all over the body, and stiffness of the neck and jaws for three days. His jaws were clenched, and his abdomen was rigid and board-like; and he exhibited frequent extensor spasms of the trunk and lower limbs, with flexion and adduction of the upper limbs. There was an old "jigger" (*Tunga penetrans*) sore on a toe, and a recent abrasion on his left shin. Chlorpromazine 50 mg. was given intravenously with almost immediate effect, and an hour and a half later he was well relaxed without spasm, his abdomen soft, and his mouth opening without difficulty. Tetanus antitoxin 10,000 units and penicillin were also given. During the next few days his spasms could be controlled by the following dosage scheme:

2nd day.—Chlorpromazine 50 mg. intravenously and phenobarbitone sodium gr. 3 intramuscularly at 9 A.M., 4 P.M., and 9 P.M.
3rd day.—As on 2nd day but omitting chlorpromazine at 4 P.M.
4th day.—9 A.M., chlorpromazine 50 mg. intravenously and phenobarbitone sodium gr. 3. intramuscularly. 9 P.M., chlorpromazine 50 mg. orally and phenobarbitone sodium gr. 3 intramuscularly.
5th and 6th days.—Chlorpromazine 25 mg. orally and phenobarbitone sodium gr. 3 intramuscularly twice daily at 9 A.M. and 9 P.M.
7th–12th days.—Chlorpromazine 25 mg. and phenobarbitone sodium gr. 3, evening only.
13th day.—Drugs discontinued.

Residual stiffness of the muscles of the abdomen and trunk gradually disappeared over the next two weeks, after which the patient was discharged.

Case 3.—An African baby, aged 12 days, had tetanus neonatorum from a septic umbilicus, and was said to have been having spasms for two days. She was treated with tetanus antitoxin 10,000 units, 'Distaquaine' penicillin 100,000 units, syrup of chloral half a drachm thrice daily, and chlorpromazine 8 mg. intramuscularly at night. The chlorpromazine and chloral gave the infant a quiet night, but the effect was wearing off next day and spasmodic convulsions would break through. The same régime was continued for four days, after which only the chloral and distaquaine penicillin were administered. After a further ten days there was only a little residual stiffness.

Conclusions

In our experience of these six cases the combination of chlorpromazine with phenobarbitone sodium in adults, and chloral in children, controlled tetanic spasms for eight to twelve hours, but not for longer. The patients' anxiety—a notable feature in tetanus—was replaced by euphoria.

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SECONDARY HÆMOCHROMATOSIS

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SECONDARY hæmochromatosis has been described in anæmic patients given many blood-transfusions; it differs from simple hæmosiderosis in that fibrosis is present in the liver and other tissues. It is thought to be distinct from classical hæmochromatosis because of the severe anæmia, which is rare in the classical disease (Sheldon 1935), and because of the different distribution of age and sex (Schwartz and Blumenthal 1948).

It was first thought that most of the deposited iron came from the transfused blood, but later cases were observed in which the amount of iron found at necropsy was too great to be accounted for by transfusions alone (Chesner 1946, Muirhead et al. 1949, Wyatt and Goldenberg 1949, Wyatt et al. 1950). So it has been postulated that, in some cases of refractory anæmia, iron continues to be absorbed from the gut even though the tissues are replete (Aufderheide et al. 1953).

Whatever the source, it has been assumed that iron can cause fibrosis in the tissues in which it is deposited; but concrete evidence of this is lacking, and it has not proved possible to produce fibrosis experimentally in the tissues of animals by overloading them with iron (Sheldon 1935).

This difficulty is avoided in the theory of Zeltmacher and Bevans (1945), who suggest that some unknown process is responsible both for the anæmia and for the fibrosis in various tissues, and that the iron, whatever its source, is deposited in tissues which are already fibrosed.

Though its cause remains uncertain, there is no doubt that fibrosis of various tissues is found in some patients who have been given many transfusions; and, though the very existence of secondary hæmochromatosis has at times been questioned (Kleckner et al. 1954), a recent case has established the entity beyond all reasonable doubt (Morningstar 1955).

The case described here is considered to be an example of secondary hæmochromatosis.

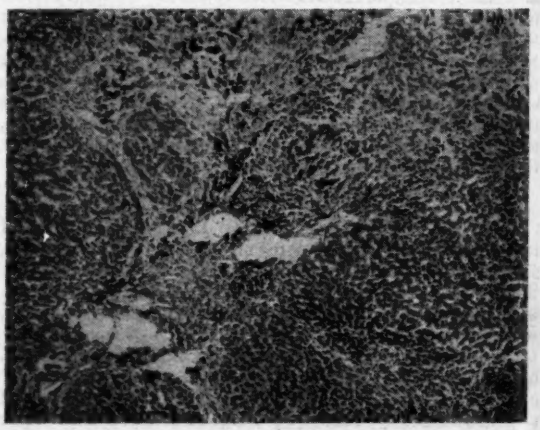
Case-report

A housewife, aged 54, was admitted to the Bolingbroke Hospital on Dec. 18, 1947, with six weeks' history of breathlessness on exertion, swelling of the ankles, and paræsthesiæ in the legs. She was found to have severe normocytic anæmia, her hæmoglobin on admission being 3·3 g. per 100 ml. and red-cell count 1,300,000 per c.mm. The red cells showed anisocytosis and poikilocytosis. Despite treatment the reticulocyte-count never rose above 2·8%. Platelet-counts on two occasions were 54,000 and 55,000 per c.mm. At this time the total and differential white-cell counts were normal, but later in the illness there was leucopenia. A direct Coombs test was negative. The sternal marrow was examined on three occasions and was found to be hypoplastic, the erythroid series being most affected. No cause was found for the anæmia, which did not respond to any hæmatinic.

Treatment and Course.—Thyroid extract was also given throughout the illness without effect. Consequently the patient was given blood-transfusions during her first admission and thereafter every four to six weeks until her death. During her illness she gradually lost her axillary and pubic hair, and her eyebrows and scalp hair became thin. The loss of hair began, and was well advanced, before much blood had been given. Later in her illness she developed an indefinite eczematous eruption on the arms and legs. Then, in the same areas, vesicles and bullæ appeared, mainly in circular groups. These soon broke down, leaving eroded oozing scaling patches. By December, 1951, she had received 99 pints of blood (17·6 g. of iron) and her skin had become a faint slate-grey, and for the first time a smooth firm liver edge was felt about $1^1/_2$ inches below the right costal margin. Glycosuria was absent throughout the illness. Her final admission was in October, 1953, when her hæmoglobin was 6·7 g. per 100 ml. and red-cell count 2,700,000 per c.mm. Her condition soon deteriorated, she developed bronchopneumonia, and despite treatment with blood-transfusions and aureomycin she died three weeks after admission. In all she was given 172 bottles of blood by transfusion in addition to 1·175 g. of iron intravenously. In the earlier part of her illness she had been given at least 1916 tablets of ferrous sulphate—equivalent to 121 g. of iron.

Necropsy.—The skin had a faint slate-grey tinge. On the arms and back of the knees there was a scaly eruption with vesicles and bullæ, some of which had broken down. The skin surrounding the eruption was thin and œdematous. The scalp hair was thin, and the axillary and pubic hair absent. The heart was dilated and flabby. The lungs showed bronchopneumonia at the bases, and the right pleural cavity contained a little seropurulent fluid. The liver was large, smooth, and mahogany-coloured; it weighed 1814 g. The spleen was dark red and weighed 170 g. The pancreas was mahogany-coloured and weighed 113 g. The kidneys, adrenal glands, and gastro-intestinal tract appeared normal.

Histology (Prof. H. A. Magnus).—Sections were examined from liver, pancreas, spleen, heart, kidneys, lung, adrenal glands, thyroid gland, stomach, a peritoneal lymph-gland, skin, and bone-marrow. In addition to hæmatoxylin and eosin, sections were stained for ferric iron by Perl's method and for ferrous iron by the Turnbull-blue method. Large amounts of ferric iron were present in all the tissues examined, but no ferrous iron could be demonstrated, and no unstained pigment granules resembling hæmofuscin were seen. The *liver* showed well-developed portal cirrhosis and a large amount of iron, much of which was within the liver cells and the epithelial cells of the bile-ducts, but large quantities were extracellular, lying in the connective tissue. The *pancreas* showed no fibrosis. Much iron was present, mainly within the cells of the acini, but some was extracellular. In these sections post-mortem autolysis made it impossible to identify any islets of Langerhans. The architecture of the *spleen* was normal, but there was some proliferation of the littoral cells and some slight increase in the amount of stromal fibrous tissue. The large amount of iron present was mainly within the littoral cells. There was a small recent infarct. The *heart* showed several small areas of fibrosis. No iron was present



Liver section showing portal cirrhosis. (Hæmatoxylin and eosin. ×31.)

in the connective tissue, but large quantities, patchily distributed, were present in the muscle-fibres. The *lungs* showed emphysema with areas of collapse. Considerable amounts of iron were present, mainly in the macrophages within the alveoli, but some was extracellular in the interstitial tissue. In the *kidneys* an occasional glomerulus showed ischæmic obliteration. A relatively small amount of iron was present, confined to the epithelial cells of the distal convoluted tubules. The *adrenal glands* contained a very large amount of iron, much of it in the cells of the zona glomerulosa, but there was a smaller quantity in the cells of the zona fasciculata. The zona reticularis contained only a very small amount of iron, which was free in the supporting stroma. A large amount of iron was present in the medulla, both within and without the cells. The *thyroid gland* was very atrophic, with some increase in the interstitial fibrous tissue, and contained much iron, mainly in the cells lining the acini. The *stomach* contained large quantities of iron, almost all within the cells lining the tubules. No iron was present in the submucous and muscular layers. The *peritoneal lymph-gland* showed irregular fibrosis, but the normal architecture was maintained. Large quantities of iron were present throughout the gland. A section of normal *skin* showed no iron and no excess of melanin. A section of the skin lesion showed epidermal hyperplasia with œdema of epidermal cells, some of which were degenerate. The underlying corium showed a non-specific cellular reaction. Sections of *bone-marrow* from various sites showed a very aplastic marrow with depression of all the cellular elements. Very large quantities of iron were present. There was no fibrosis or abnormal proliferation of bone.

Chemical Analysis.—The amount of iron present in the liver, pancreas, spleen, kidneys, heart, and lungs totalled 18·63 g., of which 17·3 g. was in the liver. It is difficult to estimate the total iron content of the body in such cases, for much of the iron is deposited in muscle and bone, and exact estimation of this iron is impossible. However, using figures arrived at by Sheldon (1935) the muscles were estimated to contain about 6·5 g. of iron and the bones 1·6 g. The remaining tissues contained, at most, about 3 g. The iron present in hæmoglobin at death was, at most, about 1 g. This makes a total of 31 g. of iron in the body. The anticoagulant and wastage being allowed for, a " pint " bottle of blood was taken to contain 380 ml. of whole blood; and the average hæmoglobin content of the blood was taken as 14 g. per 100 ml. The total amount of iron in 172 bottles was thus about 30·7 g. In addition 1·175 g. of iron had been given intravenously, making a total of 32·5 g. This was enough to account for the iron found in the body after death, even if none had been absorbed from the gut.

Distribution of Iron.—This was studied in sections, and the amount present in several organs was estimated chemically. The results were compared with figures for normal tissues given by Muirhead et al. (1949) and for normal tissues and tissues from patients with hæmochromatosis given by Sheldon (1935). The pattern of distribution of the iron had points of resemblance to both classical hæmochromatosis and to simple hæmosiderosis but was identical with neither. The liver, pancreas, and lungs were affected as in classical hæmochromatosis; and in the kidneys the amount of iron and its selective distribution were also the same as in that disease. But the bone-marrow, spleen, and heart were affected to a degree more often found in simple hæmosiderosis than in hæmochromatosis; and, as in hæmosiderosis, no hæmofuscin was detected.

Discussion

In this patient the only definite signs of hæmochromatosis were a greatly increased store of body iron and cirrhosis of the liver, but these are the only features essential for the diagnosis of the classical disease (Sheldon 1935). Diabetes was not present; and the slight, though definite, slaty pigmentation of the skin remains unexplained, for histological sections showed no deposited iron and no excess of melanin.

The loss of body hair cannot be definitely ascribed to the hæmochromatosis, but loss of body hair is not uncommon in the classical disease (Sheldon 1935).

In the present case, as in previously published cases, the fibrotic changes in the liver were not so severe as in most cases of classical hæmochromatosis. But it must be remembered that most of the patients who develop secondary hæmochromatosis have comparatively short illnesses, whereas it is generally agreed that classical hæmochromatosis is an inborn error of metabolism which begins in early life. So it is not surprising that gross fibrotic changes are the rule in the classical disease, and that less fibrosis is usually found in the secondary form.

Summary

A patient with refractory anæmia was given 172 bottles of blood by transfusion, and after death was found to have a greatly increased store of body iron and cirrhosis of the liver.

This case is considered to be an example of secondary hæmochromatosis.

I am greatly indebted to Prof. H. A. Magnus, of King's College Hospital, for the histological report and much advice. I am also grateful to Dr. J. Barrie Murray and Dr. D. I. Williams for permission to publish this description of the patient, who was under their care when I was medical registrar at the Bolingbroke Hospital. I also owe thanks to Sister N. Williams for help with the case-notes and to Mr. G. Harwood, of the department of morbid anatomy, King's College Hospital, for the photomicrograph. The chemical analyses were made by the Clinical Research Association Ltd.

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CONGENITAL INTESTINAL ATRESIA
OBSERVATIONS ON ITS ORIGIN

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REVIEWING cases of intestinal atresia at Great Ormond Street in 1951, one of us (J. H. L.) was impressed by certain features of the anomaly which suggested that some atresias may be due to interference with the blood-supply to a portion of the fœtal gut (Louw 1952). These features, which were present in most of the cases presenting with " blind ends " and applied only to mid-gut atresias, include the following:

(1) Anomalous vascular supply to the atretic portion. In about 40% there was a V-shaped defect in the mesentery. In one case, personally operated on, it was noted that the anastomotic arcades in the mesentery between the blind ends were deficient, and in two others there was thrombosis of the vessels.

(2) Early necrosis of the proximal blind end. This occurred quite apart from a complicating volvulus in 20% of the cases as well as in a further 30% with a volvulus. In more than half the cases the infant was less than 48 hours old.

(3) Postoperative atony and ileus in apparently healthy blind ends anastomosed to the distal bowel. This was a common complication in cases treated by primary anastomosis. It was suggested that the cause was primary impairment of the blood-supply rather than distension alone.

These observations have been confirmed by subsequent studies of twenty-two personal cases. Two in particular have been most instructive: in the first the distal bowel contained a segment of gut which appeared to be the remnant of an intussusception, and in the second the blind ends were separated by tissue resembling necrotic bowel which had undergone torsion. It seemed as if these cases provided evidence of two different mechanisms which might be responsible for interference with the blood-supply to a portion of the bowel.

Towards the end of the last century hypothetical " strangulation of a segment of the fœtal gut " was very popular among Continental workers. Several examples were published in which the appearances suggested strangulation by various mechanisms—e.g., volvulus, intussusception, snaring at the umbilical ring, kinks, and bands (Spriggs 1912). Some workers suggested endarteritis (Davis and Poynter 1922, Spriggs 1912).

Corroborative evidence in favour of the "vascular hypothesis" has recently been obtained from the examination of the mesenteric blood-supply in cases of intestinal atresia. Gaps in the mesentery and deficient arterial arcades have already been referred to and several other workers have reported similar observations (Spriggs 1912). The most striking finding, however, has been in three personal cases with aplasia of the descending and pelvic colons: in all of them there was complete absence of the inferior mesenteric artery.

It might be argued that strangulation causes infarction of the bowel, followed by gangrene, perforation, and peritonitis. Though this is true in postnatal life, when the bowel contains infective material, it probably does not apply to the sterile fœtal bowel. This supposition is supported by the work of Laufman et al. (1949), who showed that isolated, devascularised, and sterilised loops of bowel left in the peritoneal cavity of dogs become converted into fibrous bands or disappear entirely. It thus seems possible that strangulation of fœtal bowel may end in disappearance of the infarcted portion, with, at the most, a complicating meconium peritonitis.

Investigation

Encouraged by these observations, we decided to try to reproduce the anomaly in animals by interfering with the blood-supply to a segment of bowel in the fœtus. The experiments were done by one of us (C. N. B.) on pregnant dogs. After many disappointments due to anæsthetic and technical difficulties, death of the fœtus, premature labour, and cannibalism, success has now been achieved in two animals. The procedure consists essentially in operating on the puppy in utero and ligating the mesenteric vessels supplying a short segment of small bowel. The mother is then allowed to go to term.

The first successful result was obtained in a pup which, born three days after the operation, soon developed signs of intestinal obstruction. At necropsy the proximal bowel was grossly distended and terminated in a bulbous end. This was followed by a short segment of necrotic, collapsed bowel in the process of disintegration, and this by normal but completely collapsed bowel.

In the second case the pup was born alive 12 days after the operation and was killed 4 hours later. Necropsy revealed an anomaly of the gut identical with that found in infants with intestinal atresia (see figure). The distended proximal bowel terminated in a blind end. The infarcted section of bowel was represented merely by a fibrous cord. The distal collapsed bowel began in a blind end. Between the blind ends was a V-shaped defect in the mesentery.

Discussion

These successful experiments, together with the other observations, constitute sufficient proof that at least a proportion of intestinal atresias are due to a "vascular accident" causing infarction of a segment of the fœtal bowel and subsequent atrophy and absorption of the affected segment. Possibly meconium peritonitis may complicate such an event in some cases.

Further experimental work is being continued on the possible causes of such vascular obstruction in the human fœtus. Morbid anatomical findings have already suggested that volvulus and intussusception may be responsible. It is therefore noteworthy that in 45% of mid-gut atresias there is malfixation of the mesentery (Louw 1952), a factor which is known to predispose to both volvulus and intussusception.

The vascular hypothesis of intestinal atresia explains several features which cannot be explained on a basis of Tandler's (1900) popular theory of non-recanalisation of the gut:

(1) *The occurrence of atresias beyond the duodenum.* So far as we can gather, no embryologist has yet satisfactorily demonstrated a solid stage in the jejunum, ileum, or colon.

Proximal bowel, area of atresia, and collapsed distal bowel in puppy no. 2.

(2) *The presence of bile in the meconium of some cases of jejunal or ileal atresia* (Louw 1952). Bile is secreted from the 11th week, whereas the solid stage of the duodenum is present only from the 6th to 8th weeks of embryonic life.

(3) *Gaps in the mesentery.*

(4) *Multiple atresias.*

We do not suggest that Tandler's theory never applies, but rather that several mechanisms produce intestinal atresias. In the case of duodenal atresias (especially the membranous type) Tandler's hypothesis is probably correct, and this is supported by the observation that duodenal obstruction is often accompanied by other errors of growth, notably mongolism. In the case of small-bowel atresias the vascular hypothesis is probably correct, and this is supported by the fact that the anomaly is seldom associated with other malformations.

In conclusion we wish to point out that our observations have a practical application. If vascular obstruction is responsible for the atresia, it can be assumed that the blood-supply to the portions of bowel immediately adjacent to the atretic segment is defective. Consequently, even slight rises of tension in the proximal blind end may precipitate necrosis. Furthermore, if a timely operation should anticipate such changes, the blood-supply, although sufficient to maintain viability, may yet be insufficient to cope with the additional demands of normal peristalsis, with resultant ileus and all its untoward effects. In view of this it was strongly urged in a previous communication (Louw 1952) that the proximal blind bulbous end should always be resected in the treatment of intestinal atresias. This programme has been followed at Great Ormond Street since that time, with a consequent reduction in their mortality-rate from 69 to 33% (Macnab 1955), and our own results here in Cape Town are equally encouraging.

Summary

Clinical and morbid anatomical data in support of the hypothesis that intestinal atresia may result from interference with the blood-supply to a segment of the fœtal bowel are presented.

Experiments on dogs in which ligation of the mesenteric vessels of the fœtus have produced an anomaly identical with congenital intestinal atresia are reported.

As a result of these observations it is strongly urged that the proximal blind end should always be resected in the treatment of congenital intestinal atresia.

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Preliminary Communication

URINARY STEROIDS AFTER PREDNISONE

THE demonstration by Nabarro, Stewart, and Walker [1] and by Dudley Hart, Clark, and Golding [2] of the high therapeutic and glucocorticoid activity of prednisone (pregna-1 : 4-dien-17α : 21-diol-3 : 11 : 20-trione) suggests the possibility that this activity may be due to conversion of prednisone in the body to cortisol and cortisone. It seemed that an investigation of the metabolic products excreted in the urine during treatment with this material might throw some light on the matter.

Chloroform extracts, prepared before and after enzymic hydrolysis with β-glucuronidase, of urine from a patient receiving 75 mg. of prednisone by mouth daily have been examined by paper chromatography. The neutral fraction,[3] containing the free steroids and any chloroform-soluble conjugates which might be present, has been examined by paper chromatography using the solvent system benzene/50% methanol. The compounds detected by their absorption, reducing properties, and NaOH fluorescence have been eluted with methanol, acetylated, and rechromatographed using 1:1 light petroleum-benzene/75% methanol. No traces of cortisone or cortisol were observed, although at least five compounds were present with absorption in the region of 250–300 mμ. Only one of these gave the yellow fluorescence with NaOH typical of a Δ^4-3-ketosteroid, and the nature of this compound, which was non-reducing, is being investigated. Two of the other four compounds strongly reduced triphenyltetrazolium (T.P.T.Z.) and one of these, according to the R_f values of the free compound and of its acetate, was unchanged prednisone. The other was probably its reduction product prednisolone (pregna-1 : 4-dien-11β : 17α : 21-triol-3 : 20-dione). The remaining two compounds were devoid of reducing activity, but after oxidation with periodic acid gave compounds reacting with the Zimmerman reagent, suggesting that they contained glycerol side-chains.

The enzyme fraction [3] contained large quantities of the compounds believed to be prednisone and prednisolone as well as of the two compounds reacting with the Zimmerman reagent after periodic acid oxidation. A fifth compound, a relatively non-polar reducing substance, is being further investigated. There was no trace of tetrahydrocortisone or of tetrahydrocortisol.

We thus find no evidence that prednisone is converted in the body to cortisol, cortisone, or their derivatives. If the absorption at 250–300 mμ without a positive sodium hydroxide fluorescence reaction may be interpreted as indicating that the two double bonds in ring A of prednisone remained intact, these investigations suggest that prednisone is metabolised in part by reduction of its 11 ketone group to a 11 hydroxy group, and of its 20 ketone group.

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2. Hart, F. D., Clark, C. J. N., Golding, J. R. *Ibid*, p. 998.
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Medical Societies

BRITISH SOCIETY OF GASTROENTEROLOGISTS

THIS society's annual meeting was held at Oxford on Nov. 4 and 5, with Prof. L. J. WITTS, the president, in the chair.

Changes at Cell-membrane of Smooth Muscle

Dr. EDITH BÜLBRING (Oxford) gave an account of her studies regarding ionic and electropotential variations at the cell-membrane of smooth muscle. A skeletal muscle-cell, at rest, contained a higher concentration of potassium ions inside than outside the membrane, while sodium ions were distributed in the reverse manner: by means of micro-electrodes inserted into one cell it was possible to demonstrate a steady potential difference across the membrane of the order −40 to −80 millivolts, the inside of the cell being negative to the outside. During activity the membrane becomes permeable to potassium ions which moved out of the cell and to sodium ions which moved in; at the same time the potential fell. With the phase of recovery and relaxation the respective ions moved back to their original state of inequality on either side of the membrane. A segment of tænia coli was taken for smooth-muscle study, and one fundamental difference from striated muscle was demonstrated: the smooth-muscle cell had no steady resting potential; it persistently fluctuated between −40 and −80 milli-volts together with the respective ionic exchange. This was apparently due to the response of that cell to isometric tension. Histamine and acetylcholine induced contractions and a reduction of potential even after nervous control was blocked, so the ionic movements and potential variations were inherent properties of the cells themselves. Adrenaline brought about relaxation, and might be the substance permitting restoration of the ionic gradient across the cell-membrane and thus preparing it for further contraction.

Propulsion through Intestine

Prof. J. H. BURN, F.R.S. (Oxford), reporting on the work of D. H. P. Streeten and E. M. Vaughan Williams, who had studied the propulsive mechanism of isolated intestinal loops in dogs, said that the gut becomes atonic after reduction in the serum level of sodium chloride. The serum-potassium then rose: possibly potassium ions replaced sodium under these circumstances so that the gradient between intracellular and extracellular ions was increased. Streeten and Vaughan Williams had also studied the effects of morphine, midone, and pethidine by the same experimental method, and found that propulsion through intestine was markedly reduced by morphine (owing to spasmodic contraction), to a lesser degree by amidone, and least by pethidine. Comparing equipotent doses of morphine with pethidine, the spasmodic effect was 75 times greater with morphine; taking into account the larger dose of pethidine required to maintain the same analgesic effect as morphine the difference was of the order of 7·5 times.

Histological Studies

Attention turned to the stomach with the demonstration by Sir HOWARD FLOREY, F.R.S., of histological specimens with superimposed autoradiographs. In order to show where mucus was actively secreted he had administered radioactive sodium sulphate to laboratory animals before cutting sections of gastric and duodenal mucosa. Radioactivity was displayed in the region of the neck-cell glands of some species and always around goblet-cells, but not in Brunner's glands or at the surface epithelial cells. From this he concluded that mucus was not secreted by the epithelium, or by Brunner's glands; or if it was, then only in a mucoid form devoid of any

sulphonated ester. Considering the functions of mucus, he said that it did not act as a buffer and it had no effect on the diffusion of hydrogen and chloride ions, but it might play a part in protecting mucosa and villi by providing a mechanical buffer. He thought that Brunner's glands might be under hormonal control and that attention should be turned to them in the quest for knowledge regarding duodenal ulceration.

Dr. B. C. MORSON (London) showed further histological sections of gastric mucosa revealing intestinal metaplasia within the human stomach. He had examined over 200 specimens removed by operation for duodenal ulcer, gastric ulcer, or carcinoma. Metaplasia was present in 65% of specimens with duodenal ulcer, 82% with gastric ulcer, and 92% with neoplasm, which was often to be seen within an area of metaplasia. The distribution within the stomach varied with each condition:

Site of metaplasia	*Duodenal ulcer*	*Gastric ulcer*	*Cancer*
Pyloric antrum ..	59·1%	71·4%	87·1%
Lesser curve	15·4%	57·1%	79·5%
Greater curve ..	9·6%	39·3%	66·7%

The extent of metaplasia within the stomach also varied with the lesion in the order D.U.: G.U. = 1: 2·8, and D.U.: cancer = 1: 4·5. The older the patient the more widespread was the condition. He had noted in one stomach of a patient with addisonian anæmia that metaplasia was extensive in fundus and body, and this might account for the observation made in America that carcinoma of the stomach in this condition was found with abnormal frequency in the proximal part.

Dr. R. SCHADE (Newcastle upon Tyne) suggested that cytology might prove valuable as an aid to diagnosis of gastric carcinoma. He had even seen cells which appeared to presage malignant change though no frank growth had been found; these patients were being kept under supervision.

Coronary-artery Sclerosis and Peptic Ulcer

An analysis by Dr. GEOFFREY WATKINSON (Leeds) of 12,641 necropsies out of a total of 15,130 deaths between 1930 and 1949 suggested that there was a significant correlation between coronary-artery sclerosis and peptic ulcer—particularly gastric ulcer and also ulcer in younger age-groups.

Hormonal Effects on Gastric Function

Dr. J. KYLE and Mr. R. B. WELBOURN (Belfast) had found that in rats corticotrophin had no effect on gastric function of intact animals; but hypophysectomy reduced secretion in volume and acid content, both of which could be restored by subsequent administration of cortisone, or corticotrophin if no latent period preceded its administration. Comparable results followed adrenalectomy and the administration of cortisone. Cushing's syndrome was associated with hypersecretion, judged by a mean elevation of gastric acidity on test-meal in eight patients, and this returned nearly to normal after adrenalectomy.

Billroth and Polya Operations

Prof. J. C. GOLIGHER considered the Billroth-I operation ill-chosen for duodenal ulcer. He compared the results of 148 gastrectomies performed thus with 164 by the Polya method, with a follow-up on 138 and 132 patients respectively; all had been done for duodenal ulcer by himself, Prof. P. J. MOIR, or one of three other surgeons. The recurrence-rate after the Billroth-I operation was 15%, after the Polya type 1·5%; the satisfactory functional results were 75% and 89·8% respectively. Most recurrent ulcers after the Billroth operations were found on the reconstructed lesser curve just above the gastroduodenal anastomosis.

Mr. W. CAPPER (Bristol) commented on the frequency of bilious regurgitation after high resection and gastroduodenal anastomosis, as compared with its low incidence after a more conservative resection associated with a similar anastomosis. He thought that this might be due to an increase in the œsophagogastric angle as a result of pulling down the fundic remnant. He had also found that within five to ten years after a Billroth-I operation post-gastrectomy symptoms were negligible.

Fat Absorption

Dr. R. SCHNEIDER (Birmingham) had fed unemulsified olive-oil to rats and had demonstrated that absorption took place despite the absence of bile and pancreatic lipase. The same was true of sodium oleate and liquid paraffin; the formation of a solution was therefore not obligatory, but it was required for optimal absorption. During absorption the acid value of olive-oil within the gut lumen increased sevenfold, indicating the presence of a lipase from intestinal mucosa. Olive-oil administered in fine emulsion passed into the lacteals without the aid of upper-intestinal juices; so did oleic acid, but not sodium oleate which needed these juices for its absorption. Lipid, phospholipid, and fatty acid likewise passed into chyle. These results were contrary to those found by Prof. A. C. Frazer in previous experiments; he could not account for the discrepancy. Triglyceride synthesis was necessary to enable fatty acids to pass out of the intestinal cells, but where did the glycerol come from?

Dr. G. N. CHANDLER (Leeds) had administered to rats olive-oil tagged with radioactive iodine. Two, three, and four hours later he had killed the rats, divided the intestine into 20 segments of equal lengths, and submitted them to a Geiger count. Uptake was greatest in the third quarter of the intestine, and this area maintained its peak absorption even after transposition by previous operation to a site nearer the pylorus; the peak was lost if that section was excised.

Dr. Chandler concluded that the epithelial cells at this site had a specific function with regard to fat absorption; but Dr. H. G. SAMMONS (Birmingham) suggested another explanation—that transport of fat through the mucosa took place more rapidly at sites other than the third quarter of the small bowel.

Mr. WELBOURN remarked that rats lost fat in their stools normally, and also after removal of the stomach rumen; why then was fat absorption improved after excision of the pylorus or after total gastrectomy? Dr. SCHNEIDER declared that the loss of HCl incurred by pylorectomy or gastrectomy, but not by rumenectomy, might so alter the pH at a lower level in the gut as to favour fat absorption.

Serotonin

Dr. P. J. D. SNOW (Manchester) said that serotonin (5-hydroxytryptamine) was present in abnormal quantity in blood, plasma, serum, and platelets, and was excreted as 5-hydroxy-indole-acetic acid in the urine of some patients with malignant carcinoid tumours. It might be responsible for the unusual vascular syndrome associated with that disease which caused flushing (usually spasmodic) of the face and upper chest, sometimes brought on by small doses of alcohol.[1] Dr. MORSON had, however, seen two patients with carcinoid in whom no flushing developed despite the presence of 5-hydroxy-indole-acetic acid in the urine. Carcinoid persisted for years before causing death; it was notable that flushing occurred only in the presence of liver metastases and usually shortly before death.

Leucoplakia

Prof. H. W. ROGERS (Belfast) showed illustrations of leucoplakia of tongue and mouth. Little could be done, when the disease had reached an irreversible stage, other than continued supervision of the patient in order to treat carcinomatous change when it arose.

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Reviews of Books

Morale in War and Work

An experiment in the management of men. T. T. PATTERSON, PH.D., B.A.F., retd, senior lecturer in industrial relations, Glasgow University. London: Max Parrish. 1955. Pp. 256. 18*s*.

THIS brilliant and remarkable book is a first-hand account of a sociological and psychological experiment which Dr. Patterson made during the late war on a fighter station where the accident-rate was the highest, and the operational effectiveness the lowest, in the command. The results were spectacular and their implications, in our present industrial situation, are important.

The essence of his approach is his concern with such fundamental entities as personal morale, and the drive to identify work on the one hand with meaningful service to a group, and on the other with a sense of achievement within the group. He goes carefully into the vital importance of team spirit, which he describes as something built up within the group by the fulfilment of rôles of leadership and spokesmanship by individuals inside that group, rather than something imposed from without. He shows how inexorably frustration within a group leads to an aggressive and destructive attitude to those outside, even when the expressed concern of the outsiders is to help the group to achieve an aim of admitted importance to them all.

He draws a parallel between the sense of frustration and failure of the pilots at R.A.F. Bogfield, with concomitant prejudice, resentment, and a negative attitude to other groups on the station, and the current attitude of the miners towards the National Coal Board, of the rival railway unions towards each other, and of the dockers towards their own union representatives, as well as to the Dock Labour Board. He stresses the comparative ineffectiveness, because of their partial irrelevance, of purely financial incentives as a solution. In some circumstances these come to be regarded as bribes, to be accepted with hostile cynicism and consequently increased resistance to the achievement of their object. Since the war Dr. Patterson's ideas on human relationships have been applied within some of these industries, and have produced a fall in accident-rates, absenteeism, and sickness, a rise in productivity, and a basic change in mood and attitude. Despite results in an individual pit, they have yet to inspire a single area management committee, still less the National Coal Board.

The implementation of Dr. Patterson's ideas is impossible without patient and objective observation, combined with unobtrusive tact and skill in human contact. They may, therefore, have been distantly regarded as impracticable or, with supreme irony, as uneconomical. But to doctors, concerned with human happiness and well-being, they are both relevant and stimulating, and demand attention.

Medical and Public Health Laboratory Methods

JAMES STEVENS SIMMONS, M.D., PH.D., dean and professor of public health, Harvard University; CLEON J. GENTZKOW, M.D., PH.D., director, Bureau of Laboratories, Department of Health, Commonwealth of Pennsylvania. London: Kimpton. 1955. Pp. 1191. £6 15*s*.

FOR success a laboratory test depends upon sound reasoning, foolproof technique, and, very often, some tricks of the trade which may be incommunicable except by personal demonstration. It is the omission of these last which robs almost all books on technical methods of their claims to completeness. Professor Simmons and Colonel Gentzkow have written one of the best, but the experienced reader will often be tempted to add a footnote here and a small correction there. The reader's methods are probably no better than those recommended in this book, but in his hands they work better, and nothing gives a reader so much confidence in a book of "know how" as internal evidence that the author has used every method himself with satisfaction.

The book is comprehensive, but within the space, despite small type, some chapters are cut pretty short. The section on methods used in veterinary pathology, for instance, would be more useful to doctors if it were a good deal longer. Some of the best pathologists get into trouble when they essay a necropsy on an animal or bird. Prof. E. C. Faust's chapter on worms is a masterpiece of lucid compression. A section on toxicology is unexpected and praiseworthy, as are General Hawley's chapters on elementary statistical methods.

The book is expensive, but it offers a great deal of solid information in handy compass. It makes little attempt to interpret results: it is a book to be left on the laboratory bench to answer questions as they arise, and it will seldom be found wanting in a sensible answer.

Manual of Army Health: 1954

Pp. 686. Not on sale to the public, but members of the medical profession may obtain copies by applying to the Army Publications Depot, Kimber Road, London, S.W.18.

IF the young officer joining the R.A.M.C. believes that he has nothing to learn, a few weeks spent as a regimental medical officer are likely to surprise him. Opportunities for the display of exceptional diagnostic acumen will be rare, but he will be expected to have expert knowledge of the inspection of cookhouses, the ventilation of barracks, and the smell of drains. Treatment of the sick will occupy far less of his time than the maintenance in health of men whose occupation may be either pen-pushing in a stuffy office or climbing horrifying crags at sub-zero temperatures. Little of this was in the curriculum, and we take it that the main purpose of this book is to help the Army doctor to find the answers to the problems, not all of them strictly medical, which he will meet every day.

It begins with an account of the organisation of the health services of the Army. Thorough though this is, it would be more useful if it had been written with more thought for the regimental medical officer. The chain of command is viewed from above rather than through the eye of the ignoramus who wishes to know to whom he should turn for orders or advice. Some reference to the supply of medical equipment would add to its value. The chapters on meteorology and climate will be useful to the man who wishes to think out his own answers (and, contrary to rumour, this process is not always condemned in the Army). Equally useful are the chapters on housing and ventilation, though the relevant sections might have been integrated more closely with the chapters on water-supply and drainage. Considering the skill and originality of the Army in providing drinkable water under unlikely circumstances, the first is disappointing: it lacks the illustrations which may turn bare print into valuable working instructions, and is less impressive than the corresponding chapter in the old *Army Manual of Hygiene, 1934*. The second is the outstanding contribution to this book. Helped by a generous array of pictures, it is a complete yet succinct guide to the disposal of waste matter under all conditions. The chapter on feeding is surprisingly interesting, and that on clothing is a novelty in such a publication in its pious wishes for improvement.

A long chapter on arthropod pests is handsomely illustrated by blocks prepared for this work. They are good, but we doubt whether they will be much help unless supplemented by some brief advice on the methods of examining these creatures with needle and hand-lens. Such comments as "neurasthenia has been reported," in the account of bed-bugs, are superfluous. Appropriately this chapter leads on to those on insecticides, disinfection, and disinfestation. The advice is sound, but, as elsewhere in the book, it would be improved if the materials and machinery recommended were referred to by their official designations in the Ordnance Vocabulary. The common difficulty is to know, not what one would wish to use, but what is available. The chapters on inspections of personnel and quarters, on medical classifications, and on occupational health all contain just the sort of advice that the young officer needs and which he is often too shy to ask. Lastly, there is an extensive section on the control of the individual infectious diseases. Much of this is beyond criticism; but once again it would have been improved by better integration with other sections of the book: for example, swabbing of the contacts of cerebrospinal fever is deprecated on p. 444 and advised on p. 634. Methods for the destruction of rats, as useful at Aldershot as at Kano, are concealed in the pages on plague. Following the pattern of the *Army Manual of Hygiene*, much of what is most valuable is included in appendices: how to work a water-truck, how to improvise a disinfestor, and how to impregnate clothing with insect repellant. Perhaps the most useful of all is the olla-podrida

of facts, figures, and conversion tables which ends the book. The index is better than is usual in Army manuals.

Criticism is easy where so much ground is covered. But the conclusion can only be that this book fulfils its purpose admirably.

Dextran

Its Properties and Use in Medicine. JOHN R. SQUIRE, M.D., F.R.C.P., director of the division of pathological studies, University of Birmingham; J. P. BULL, M.D., director, M.R.C. Industrial Injuries and Burns Research Unit, Birmingham Accident Hospital; W. d'A. MAYCOCK, M.D., Lister Institute of Preventive Medicine, Elstree, Herts.; C. R. RICKETTS PH.D., F.R.I.C., university research fellow, Birmingham. Oxford: Blackwell Scientific Publications. 1955. Pp. 91. 15*s*.

THIS short monograph covers our knowledge of the series of polyglucoses collectively known as dextran. It was first observed in refineries as a slime formed during the purification of sugar, and Pasteur recognised that the substance known as native dextran was produced by the microbial action of various cocci, later identified as belonging to the genus leuconostoc.

The monograph describes in detail its chemical and physical properties and the clinical and experimental effects following its infusion. In a chapter on general properties of plasma substitutes, eight important positive qualities are listed. It is stressed that when dissolved to make a solution, the substance should exert a colloid osmotic pressure of the same order as plasma and that it should be retained in the bloodstream until its place has been taken by the normal plasma-protein. Desirable negative qualities are that it should not be antigenic or toxic, that there should be no permanent histological changes and no diuretic action. None of the substances which have been tried as plasma substitutes fulfil all the conditions laid down, but dextran approaches the ideal more closely than any other.

The behaviour of dextran in the body and as an antigen is discussed. The authors recommend that whenever dextran of high average molecular weight is to be used a sample of blood should be withdrawn before the infusion so that dextran-free serum will be available for compatibility tests. This precaution removes the possibility of errors due to increased rouleaux formation of the donor's red cells. Its clinical uses in "shock" and in nephrotic states are briefly discussed.

The book is clearly and concisely written and carries the authority of the experience gained by the authors in the Medical Research Council's industrial injuries and burns research unit in Birmingham. It is an up-to-date record of opinions of the uses of plasma substitutes in general and of dextran in particular and will be of value to the specialist. The authors hold that, until more is known of the functions of plasma constituents, dextran, in common with other plasma substitutes, should be used in normal transfusion practice only when it is necessary to wait for compatibility tests to be done and when plasma is not available. It is also of value where the transfusion service is inadequate and in national emergencies. For the general reader, the price is high for a short account of a rather limited subject.

Human Physiology (4th ed. London: J. & A. Churchill. 1955. Pp. 616. 32*s*.).—A new edition of Winton and Bayliss's textbook is welcome, especially since its dimensions have not been increased. Many chapters have been entirely rewritten, and the result is a balanced and readable account of the whole subject combined with a considerable amount of new information and pointers to future developments. There is a useful short bibliography at the end. Any student who digests the contents of this book should have a sound understanding of the fundamentals of physiology.

Group Processes (New York: Josiah Macy, jun., Foundation. 1955. Pp. 334. $5.50).—The transactions of the first conference on this subject sponsored by the foundation, which was held in New York in September, 1954, have now been published under the editorship of Dr. Bertram Schaffner.

Transactions of the Fifth Conference of the International Society of Geographical Pathology (Basle: Karger. 1955. Pp. 572. Sw. fr. 67.60).—The transactions of this conference, which was held in September, 1954, at Washington, D.C., have been published under the editorship of Prof. F. C. Roulet, the secretary-general of the society.

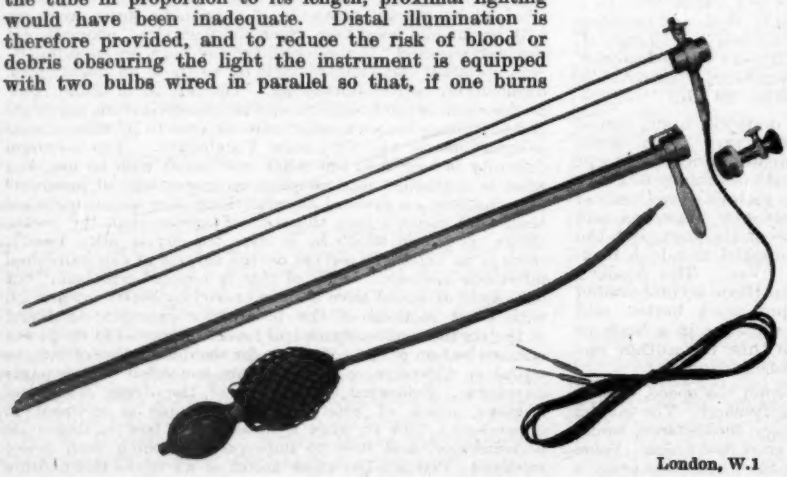
New Inventions

AN ŒSOPHAGO-GASTROSCOPE WITH INFLATOR

THIS instrument is intended especially for examining lesions at the lower end of the œsophagus and sometimes on the upper part of the lesser gastric curvature.

The length of tube that can be passed beyond the incisor teeth is 54 cm., and the lumen measures 1·3 cm. anteroposteriorly and 1·8 cm. from side to side—dimensions similar to those of the instrument designed by Mr. R. H. Belsey of Bristol. Owing to the slimness of the tube in proportion to its length, proximal lighting would have been inadequate. Distal illumination is therefore provided, and to reduce the risk of blood or debris obscuring the light the instrument is equipped with two bulbs wired in parallel so that, if one burns out, the other remains. The light-carrier ring is tapered and is a press fit into the body of the instrument. The twin light stems preclude any twisting movement in releasing the light-carrier ring from the body for cleaning, and so a small lever with cam is mounted on the body by which the parts may be easily separated when necessary.

To improve the view of the small picture seen at a great distance, a simple detachable telescope is fitted at the near end. The whole instrument is closed and a small air-bulb attached, so that the stomach may be inflated when the distal end passes through the cardia. This bulb may also be used for testing the rigidity or mobility of the œsophageal wall, and for demonstrating the position of the lumen when, for example, it is partially filled by growth and difficult to identify. After endoscopy, if the inflator has been used, it is wise to pass my ball-ended gum-elastic gastric catheter to release the air from the stomach. I usually do this after ordinary gastroscopies too.



This œsophago-gastroscope has been made for me by the Genito-Urinary Manufacturing Company, 28a, Devonshire Street, W.1, who also supplied extra-long biopsy forceps and a special forceps for placing marker clips (silver brain clips) on the mucosa for radiographical purposes.

H. DAINTREE JOHNSON
F.R.C.S.
London, W.1

THE LANCET

LONDON: SATURDAY, NOV. 19, 1955

The Use of Cortisone

IT is more than seven years since cortisone was first given for the treatment of rheumatoid arthritis,[1] but there is still doubt about the indications for its use in this and many other diseases. There are several reasons for this uncertainty. At first supplies of cortisone were limited by difficulties in manufacture, and in Great Britain imports were necessarily restricted for economic reasons. In time, when cortisone became relatively plentiful, it was found that in rheumatic fever, for example, careful observation over a period of years was needed to assess whether, when given in the acute phase, it was more effective than other kinds of treatment in preventing subsequent valvular lesions. And such studies are difficult: large numbers of patients must be treated with cortisone at different dosage levels and compared with an equal number of paired cases treated by more orthodox means. Finally, there has been the psychological difficulty of accepting that cortisone is not some new, all-powerful, curative "antibiotic" but only something that suppresses the manifestations of disease. Disappointment on this account has led to the unmerited rejection of cortisone by some people, and many have failed to appreciate that it has in fact established itself as a valuable drug. Sufficient is now known to justify making cortisone more widely available, but a heavy responsibility rests on the general practitioner who uses it, for it is expensive and it has potentially dangerous side-effects. Its long-continued use in chronic diseases demands a thorough familiarity with these side-effects and how best to avoid them. On p. 1078 of this issue Dr. R. I. S. BAYLISS discusses in detail the use and limitations of cortisone in general practice, and gives guidance to those unfamiliar with its many possibilities.

The indications for giving cortisone by mouth may be divided into absolute and relative. Absolute indications are those conditions in which cortisone has been found to be of undoubted value and for which no other treatment is equally effective. These include Addison's disease [2] and Simmonds's disease [3] and the condition following adrenalectomy undertaken to retard the growth of an inoperable carcinoma of the breast or prostate. Here cortisone provides rational substitution therapy. In larger—pharmacological—doses cortisone has been life-saving in disseminated lupus erythematosus,[4] particularly if given before the kidneys are involved, and in pemphigus vulgaris.[5] Sufficient is given to suppress the clinical manifestations: this may mean up to 300 mg. daily in divided doses, but as soon as the disease has been brought under control the dose is gradually reduced to the least that will keep symptoms and signs in check. Even this maintenance dose may produce side-effects, but these disadvantages may have to be accepted, considering that without cortisone the patient would die. In most cases treatment must be continued to prevent a relapse, but sometimes a remission has been induced for weeks or months. Bronchial asthma is only a relative indication, but cortisone may be life-saving in status asthmaticus unresponsive to more orthodox treatment.[6] Any superimposed infection should be treated with an appropriate antibiotic, usually penicillin, and as soon as the attack has been relieved the dose of cortisone should be reduced from the large amount required initially (usually 200–300 mg. daily) and gradually withdrawn over a week or ten days. Although its effect is less certain, cortisone is indicated in the early stages of polyarteritis nodosa. Congenital adrenal hyperplasia, a rare disorder characterised by pseudohermaphroditism in girls and precocious sexual development in boys, responds to cortisone [7]; this is important because it demonstrates how cortisone can suppress the anterior pituitary. In this condition the adrenal cortex is unable to synthesise hydrocortisone,[8] and the pituitary therefore secretes more corticotrophin in an attempt to evoke more hydrocortisone. The adrenal glands respond by producing more androgenic steroids, which account for the virilisation of the patient and the high urinary excretion of 17-ketosteroids. By giving cortisone in appropriate doses, the activity of the pituitary and the adrenal glands is lessened, the excretion of 17-ketosteroids falls to normal, and the virilising process is arrested.[9] This suppressive action on the pituitary and adrenal glands occurs whenever cortisone is given, and explains why it is always important on stopping treatment to reduce the dosage gradually and not suddenly. Gradual reduction allows the physiologically atrophic adrenal glands to start secreting again; otherwise a dangerous state of temporary adrenal insufficiency may be induced.

The relative indications for oral cortisone fall into two main groups. First, there are those conditions in which a satisfactory response is sufficiently common to merit the use of cortisone if other treatment has failed, if the severity of the illness justifies the risk inherent in the use of cortisone, and if there are no contra-indications to its use. Included in this group are rheumatoid arthritis,[10] acute rheumatic fever,[11] sarcoidosis (if in the early stages and associated with much pulmonary involvement [12] and/or hypercalcæmia [13]), bronchial asthma [14] (*not* chronic bronchitis and emphysema), the nephrotic syndrome,[15] thrombo-

1. Hench, P. S., Kendall, E. C., Slocumb, C. H., Polley, H. F. *Proc. Mayo Clin.* 1949, **24**, 181.
2. Thorn, G. W., Forsham, P. H., Frawley, T. F., Wilson, D. L., Renold, A. E., Fredrickson, D. S., Jenkins, D. *Amer. J. Med.* 1951, **10**, 595. Fourman, P., Horler, A. R. *Lancet*, 1954, 1, 334.
3. Caughey, J. E., James, A., MacLeod, E. K. *Brit. med. J.* 1952, 1, 1216. Sheehan, H. L., Summers, V. K. *Ibid*, 1954, i, 723.
4. Baehr, G., Soffer, L. J. *Bull. N.Y. Acad. Med.* 1950, **26**, 229.
5. Frazier, C. N., Lever, W. F., Keuper, C. S. *Amer. J. med. Sci.* 1951, **222**, 308.
6. Davies, B. M., Williams, D. A. *Brit. med. J.* July 30, 1955, p. 293.
7. Wilkins, L., Lewis, R. A., Klein, R., Gardner, L. I., Crigler, J. F., Rosenberge, E., Migeon, C. *J. clin. Endocrin.* 1951, **11**, 1.
8. Bayliss, R. I. S., Broadbent, I. E., Steinbeck, A. W. *Lancet*, 1954, 1, 434.
9. Wilkins, L., Gardner, L. I., Crigler, J. F., Silverman, S. H., Migeon, C. J. *J. clin. Endocrin.* 1952, **12**, 257.
10. Hart, F. D. *Brit. med. J.* 1954, i, 1205. Copeman, W. S. C. *Ibid*, p. 1109. Medical Research Council. *Ibid*, Sept. 17, 1955, p. 695.
11. Massell, B. F. *New Engl. J. Med.* 1954, **251**, 183.
12. Hoyle, C., Dawson, J., Mather, G. *Lancet*, 1955, i, 638.
13. Anderson, J., Dent, C. E., Harper, C., Philpot, G. R. *Ibid*, 1954, ii, 720.
14. Savidge, R. S., Brockbank, W. *Ibid*, p. 889. Baldwin, H. S., Spielman, A. D., Dworetzky, M. *J. Allergy*, 1955, **26**, 44.
15. *Lancet*, Oct. 29, 1955, p. 915.

cytopenic purpura,[16] acquired hæmolytic anæmias,[16] ulcerative colitis,[17] and temporal arteritis. Not all these diseases are equally responsive, and in many the place of hormone treatment is still uncertain; but the main reasons for its use are outlined in Dr. BAYLISS's paper. The management of acute conditions, such as rheumatic fever, and the attitude towards side effects are quite different from those in the chronic diseases such as rheumatoid arthritis. As HENCH said at the recent Pan-American Congress on Rheumatology, in acute conditions the aim is prompt and maximum control until the disease ends spontaneously: dosage is governed by the severity of the disease rather than by concern over the development of the less important side-effects. In chronic diseases the aim is to strike the best balance between relief of symptoms and the side-effects; and dosage is governed more by the avoidance of undesirable effects than by the severity of symptoms. There is still much uncertainty about cortisone in the treatment of acute rheumatic fever. A Medical Research Council trial[18] indicated that equivalent symptomatic relief was obtained with cortisone or salicylates and that during the limited follow-up period there was no significant difference in the emergence of valvular lesions in the two groups. These results may be criticised on the ground that the dose of cortisone was too small and inflexible. There is increasing evidence from America[19] that in larger doses, regulated to suppress the activity of the disease, cortisone may prevent permanent cardiac damage. HENCH[20] likens rheumatic fever to a violent but short-lived storm during which intensive cortisone treatment must provide maximum protection until the storm blows over. This treatment must be "soon enough, intense enough, and long enough." The second group of relative indications for oral cortisone contains a large number of diseases that may respond to some extent but neither consistently nor dramatically. They include ankylosing spondylitis, dermatomyositis, scleroderma,[21] and steatorrhœa.

The side-effects of oral cortisone must be kept in their proper perspective and not ignored or overemphasised. Particularly important are the reactivation of latent tuberculosis, the onset of peptic ulceration, the masking of a concurrent infection, and the development of mental disturbances.[22] Experience has shown that these side-effects can largely be avoided by keeping the dose to the lowest that will produce the desired result.

Finally, the application of hydrocortisone to the skin and of hydrocortisone or cortisone to the eye has been very valuable in certain dermatological[23] and ophthalmic disorders. This form of treatment is being widely used and has the great advantage that no systemic side-effects develop. Such intractable conditions as pruritus ani and vulvæ usually respond in a matter of hours, but a small amount of ointment applied daily or on alternate days may be necessary to maintain relief. In iridocyclitis and keratitis, cortisone applied locally will relieve pain and exudation and prevent vascularisation of the cornea.

16. Medical Research Council. *Brit. med. J.* Aug. 20, 1955, p. 455.
17. Truelover, S. C., Witts, L. J. *Ibid*, Oct. 29, 1955, p. 1041.
18. Medical Research Council. *Ibid*, 1955, i, 555.
19. McEwen, C. *Amer. J. Med.* 1954, **17**, 794. Greenman, L., Weigand, F. A., Mateer, F. M., Danowski, T. S. *Amer. J. Dis. Child.* 1955, **89**, 426.
20. Hench, P. S. First Pan-American Congress on Rheumatology. 1955.
21. Zion, M. M., Goldberg, B., Suzman, M. M. *Quart. J. Med.* 1955, **24**, 215.
22. Rouche, B. *New Yorker*, 1955, Sept. 10, p. 47.
23. Russell, B., Pegum, J. S., Thorne, N. A., Grange, R. V. *Lancet*, 1955, i, 1038.

Subacute Bacterial Endocarditis

THE prognosis of subacute bacterial endocarditis has improved dramatically since the introduction of penicillin, but an early diagnosis is still essential if treatment is to give the best results. The unmistakable stigmata of the established disease have been fully described.[1 2] The onset is usually insidious. Symptoms of fever (sweating, chills, and rigors) were the initial complaints in 63% of CATES and CHRISTIE's series[3] in 1951. Symptoms referable to "toxæmia," such as lassitude, malaise, and generalised aches and pains, commonly accompany the feverish ones. There may be flitting joint pains as well, and these do not necessarily indicate coincident rheumatic fever. Headache may be an initial symptom in a few patients, but it does not imply they are prone to cerebral vascular catastrophe.[3] The effects of arterial embolism usually follow: abdominal pain due to splenic, renal, or mesenteric infarction is not uncommon, and neurological symptoms may be the result of cerebral embolism. One of the most important features is the Osler's node, a red and tender swelling in the pulp of a finger or toe; and sudden pain, coldness, or sensory disturbances in a limb may signal an embolus. Retinal emboli are less common, and pulmonary emboli are most likely in patients with infection involving a congenital lesion with a left to right shunt. The infected arterial emboli may give rise to mycotic aneurysms, although this is usually a late manifestation, CATES and CHRISTIE point out that in some cases the presenting symptoms may be those of arterial embolism or of cardiac insufficiency. The physical signs in the fully established case are malnutrition, an "earthy" pallor, anæmia, cardiac murmurs, petechial hæmorrhages in skin, conjunctivæ, or other mucous membranes, splinter hæmorrhages under the nails, splenomegaly, clubbing of the fingers, Osler's nodes, and, possibly, signs of cardiac failure. Quite often there is evidence of a previous embolism in a limb or other artery.

The duration of the infection is important in prognosis, and patients who have been infected for twenty weeks or more have less than a 50% chance of recovery. This emphasises the importance of recognising the early manifestations of subacute bacterial endocarditis, and in an article which we publish this week Dr. WEDGWOOD examines these in detail. Although, as he points out, the early symptoms may be trivial, patients often seek medical advice early. Yet the vagueness of many of the early symptoms, and the paucity of physical signs, may lead to an initial diagnosis of influenza, "fibrositis," anæmia, or even "nervous breakdown." Many valuable weeks may be lost and the patient's chance of full recovery seriously jeopardised, since the longer the infection goes unrecognised the greater the cardiac damage. Moreover, the likelihood of heart-failure is proportional to the duration of

1. Horder, T. J. *Quart. J. Med.* 1909, **2**, 289.
2. Horder, T. J. *Lancet*, 1926, i, 745.
3. Cates, J. E., Christie, R. V. *Quart. J. Med.* 1951, **20**, 93.

infection, and the ultimate prognosis is far worse in patients who already have congestive failure before the infection is treated.[3 4] It is disquieting to read that the average duration of symptoms before admission to hospital in Dr. WEDGWOOD's 65 cases was ten weeks, with a range of one to thirty-one weeks. But even when the symptoms are vague, the combination of fever and a cardiac murmur is almost always present: a murmur was found in 97% and fever in 92% of Dr. WEDGWOOD's cases within one week of admission. In 20% of the cases, however, and in 45% of those with symptoms for six weeks or less, pyrexia and a murmur were the only physical signs during the first week in hospital. Changes in the cardiovascular signs are particularly helpful in diagnosis, and change in the character of the murmur during the illness is highly suggestive of infection. The murmurs are usually loud and unmistakably organic, and in most cases they are due to isolated mitral or aortic incompetence, signs of pure mitral or aortic stenosis being rare.[5] Congenital heart-disease accounts for relatively few cases. Congestive cardiac failure is rare early in the disease, and was present in only 11% of Dr. WEDGWOOD's series. Hypertension is also uncommon, but auricular fibrillation may sometimes appear.[3] Careful inquiry must be made for special symptoms such as pains in the finger-tips or elsewhere, "rheumatism," anorexia, loss of weight, and night sweats. The association of a recent dental extraction with the onset of malaise and fever should excite suspicion, especially if the patient is known to have heart-disease. Occasionally frank hæmaturia may be an early symptom. Careful physical examination will usually reveal important signs, even in the early stages of the disease, but, as Dr. WEDGWOOD notes, many of these are transitory (such as petechiæ, small embolic lesions, and splenomegaly), and daily examination is very important. Petechiæ must be sought for, particularly in the conjunctivæ, mouth, fingers, and nail-beds.

The disease is rare in children under five [6] and commonest in people between twenty and forty. It is apparently becoming more common in the elderly, and in another article this week Dr. ANDERSON and Dr. STAFFURTH describe a series of 76 cases, 62 confirmed by blood-culture or necropsy, of which 14 were over the age of sixty and 5 over seventy. They found that the disease came on more insidiously in old people, and that emboli, other than a few petechiæ, were unusual. Like Dr. WEDGWOOD, they hold that the diagnosis is often missed because it is not considered. WALLACH et al.[7] observed that bacterial endocarditis in the elderly was usually acute rather than subacute, and that it often involved valves affected only by sclerotic and not rheumatic, changes. Renal lesions too were less common in the older patients.

The most important investigation is blood-culture. Whenever possible, blood for culture should be taken at the height of the fever, but positive cultures may be obtained when the patient is afebrile.[4] In obscure cases, culture of arterial blood or bone-marrow [8] may be positive when no organism has been grown from venous blood. In coarctation of the aorta, blood should be taken from the femoral rather than the brachial artery.[9] Failure to get a positive culture, however, does not entirely exclude infective endocarditis, for 2 of the cases described by NEWMAN et al.[4] had negative cultures. Other evidence of infection should always be sought. A raised erythrocyte-sedimentation rate is almost invariable; and a blood-count will show anæmia and some polymorphonuclear leucocytosis in about 80% of cases. Albumin and showers of red cells in the urine are less common, but they are very valuable signs.

Confusion may be caused by an atypical onset or unusual features. Thus, macroscopic hæmaturia and œdema may suggest nephritis, especially when there has already been severe renal damage. The absence of hypertension and characteristic changes in the optic fundi should help to avoid this mistake. Greater difficulty may be found in differentiating disseminated lupus erythematosus from subacute bacterial endocarditis in which arthralgia is a feature; for malaise, fever, heart murmurs, anæmia, splenomegaly, and renal involvement may be present in both diseases. But in the former the characteristic rash of lupus, the leucopenia, the pericarditis, and the lupus-erythematosus cells in the blood should point to the right answer; moreover, hyperglobulinæmia is always found in disseminated lupus erythematosus,[10] and rarely in infective endocarditis.[4] Polyarteritis nodosa may also cause trouble in differential diagnosis, but here signs of organic valvular disease are rare and hypertension is common. Subacute bacterial endocarditis may also be mistaken for atypical rheumatic fever or rheumatoid arthritis, and the diagnosis should always be kept in mind in any feverish illness with widespread joint pains or arthritis.

Genetics of Sickling

THE sickle-cell trait is common among Negroes in Africa and America, and it is fairly common too in some aboriginal communities in Southern India. On the other hand, it is extremely rare in white Americans and in Europeans, with the exception of a few scattered communities in Greece and Southern Italy. Even in those parts of Africa where the trait is very common, affecting 15–25% of the total population, there are remarkable differences in its frequency from tribe to tribe. Thus, among tribes living in Uganda, LEHMANN and RAPER [11] found enormous variations in the prevalence of the trait, ranging from 0·8% to 45%. As we observed last year,[12] this distribution of the sickle-cell gene raises two important questions in human genetics. How does a gene which in homozygous form produces a disease that is generally fatal in childhood or adolescence, attain such a frequency in certain populations that up to 40% of the people may be heterozygous for it? How is it that such a gene is very common in some populations and virtually absent in others? If homozygous individuals die young, each successive generation should show a steady decline in the frequency of the gene. But, in fact, in certain populations the gene has reached and

4. Newman, W., Torres, J. M., Guck, J. K. *Amer. J. Med.* 1954, 16, 535.
5. Fulton, M. N., Levine, S. A. *Amer. J. med. Sci.* 1932, 183, 60.
6. Rost, W. L., Fischer, A. E. *Amer. J. Dis. Child.* 1928, 36, 1144.
7. Wallach, J. B., Glass, M., Lukash, L., Angrist, A. A. *Ann. intern. Med.* 1955, 42, 1206.
8. See *Lancet*, 1954, i, 1017.
9. Bloomfield, A. L. *Circulation* 1953, 8, 290.
10. Gold, S. C., Gowing, N. F. C. *Quart. J. Med.* 1953, 22, 457.
11. Lehmann, H., Raper, A. B. *Nature, Lond.* 1949, 164, 494.
12. See *Lancet*, 1954, ii, 479.

maintained a high frequency; so in such populations there must presumably be something that counteracts the heavy pressure of natural selection against the abnormal gene.

These questions were discussed by Dr. J. V. NEEL, of the University of Michigan, in his Galton lecture at University College, London, last month. There are, he pointed out, two possible explanations for the distribution of the sickle-cell gene. First, fresh mutations from the normal to the abnormal gene may be so common as to offset the abnormal genes lost in each generation by the relatively early death and consequent infertility of the abnormal homozygotes. Alternatively, the heterozygotes may have a higher effective fertility than the normal homozygotes (" balanced polymorphism ") because, on the average, more heterozygotes survive to adult life than do normal homozygotes, or because matings between heterozygotes are more fertile than those between normal homozygotes. The genes lost by the infertility of the abnormal homozygotes could thus be balanced by the abnormal genes gained in each generation through the relatively increased fertility of the heterozygotes. The mutation hypothesis requires very high mutation-rates, localised to certain areas or populations and specific to a particular chromosomal locus. If " balanced polymorphism " is the answer, then individual heterozygous " sicklers " must have up to a 25% selective advantage over " non-sicklers." Either possibility has such significant implications in genetics and medicine that it is important to decide which is the true one.

Theoretically, the mutation-rate of the gene in any population can be worked out from the prevalence of the trait and a knowledge of how commonly a person with sickle-cell anæmia has only one parent with the trait (or how commonly a person with the trait has both parents without it). But in practice this is not so easy. Where there are doubts about paternity it is often advisable to confine observations to cases in which the mother is the exceptional parent—that is to say, in which the mother of a child who appears to be homozygous for the sickle-cell gene is not herself heterozygous. Another possible difficulty is " non-penetrance " in the exceptional parent, perhaps because of a " suppressor " or " modifying " gene; and there is always the chance that the exceptional parent may carry the gene for some other hæmatological defect, so that the child's disease is the result of double heterozygosity. In these circumstances, further investigation of the mother's relatives and detailed study of her blood may help. Dr. NEEL observed that although these inquiries may not prove that an individual case was the result of a mutation, they should set an upper limit on the over-all mutation-rate of the gene in the particular population being studied.

In a study on these lines by VANDEPITTE et al.[13] in the Belgian Congo, where about 25% of people have the trait, it was found that among 233 mothers of children with sickle-cell anæmia 231 showed the sickling phenomenon and 2 did not. The hæmoglobin of the 2 exceptions was normal on electrophoresis, and they had no obvious blood disorders. This finding places the upper limit of the mutation-rate at $1{\cdot}7 \times 10^{-3}$ per gene per generation. This is a very high figure for human mutations, but still only about a tenth of the rate needed to maintain the gene frequency in this population, assuming that the heterozygote was neutral. If, in fact, the sickle-cell genes in this population were being maintained by mutation then the mutation-rate would have to be about $1{\cdot}6 \times 10^{-2}$ per gene per generation, and VANDEPITTE et al. would have found about 18 exceptional mothers. Another survey[14] in the same area yielded much the same results. Thus it seems that mutation cannot alone be responsible, though clearly many more surveys are required.

VANDEPITTE et al. emphasised that their estimate is only a possible upper limit to the mutation-rate and that the true value may be very much lower. Judging from the rarity of reports of sickle-cell anæmia in Caucasian people, it seems that here the mutation-rate is probably less than 1×10^{-5} per gene per generation. Presumably, therefore, we must accept the view that mutation-rates differ widely in different populations, or find some special explanation to account for the exceptional cases.

The alternative of " balanced polymorphism " has been closely examined in the past year or two, particularly since the publication of ALLISON's important findings.[15] He gave persuasive evidence[12] that sickle-cell heterozygotes were more resistant to malaria than normal individuals, and consequently had a greater chance of surviving to adult life in malarial countries. A lively controversy has since developed, largely over the relative frequency of parasitæmia in sicklers and non-sicklers.[16–22] Some workers believe that their findings are consistent with a different susceptibility, while others could find no support for ALLISON's hypothesis. As Dr. NEEL remarked, it has become clear that no-one's series is quite comparable with anybody else's. So far only BEUTLER et al.[23] have recorded an attempt to repeat ALLISON's experiment of inoculating sicklers and non-sicklers with *Plasmodium falciparum*. They found only very slight and probably insignificant differences in susceptibility between the two groups. The main difference between the experiments was that ALLISON's subjects were all highly immune, while those of BEUTLER et al. were either non-immune or only slightly immune. Moreover, ALLISON used an African and a Malayan strain of *P. falciparum*, and BEUTLER et al. used a Panamanian strain. Whether these differences account for the contrasting results remains to be seen when this critical experiment has been repeated.

Whatever the result, the demonstration of increased resistance to a disease such as malaria is not in itself enough to clinch the case for a balanced polymorphism. It must also be shown that there is in consequence a difference in effective fertility between the heterozygote and the normal homozygote—a difference sufficiently great to account for the observed gene frequencies. If the hypothesis is correct, the heterozygous genotype should be commoner among adults in the reproductive period than among infants and children; or matings of heterozygotes should be, on the average, more fertile than other matings. There are as yet very few data from which to decide whether this is so; but it should be possible to collect them. If altered resistance to malaria was the only factor in a balanced polymorphism, then striking differences in malaria mortality should be found in sicklers and non-sicklers. Dr. NEEL gave an example of this: if sickle-cell anæmia were invariably lethal, and 40% of adults had the trait under conditions of maximum pressure from malaria, then there must be

13. Vandepitte, J. M., Zuelzer, W. W., Neel, J. V., Colaert, J. *Blood*, 1955, **10**, 341.
14. Lambotte-Legrange, J., Lambotte-Legrange, C. *Ann. Soc. belge Méd trop.* 1955, **35**, 47.
15. Allison, A. C. *Brit. med. J.* 1954, i, 290; *Trans. R. Soc. trop. Med. Hyg.* 1954, **48**, 312; *Ann. hum. Gen.* 1954, **19**, 39.
16. Mackey, J. P., Vivarelli, F. *Brit. med. J.* 1954, i, 276.
17. Edington, G. M. *Ibid*, p. 871.
18. Raper, A. B. *Ibid*, 1954, ii, 1162; *Ibid*, 1955, i, 1186.
19. Moore, R. A., Brass, W., Foy, H. *Ibid*, 1954, ii, 630.
20. Foy, H., Timms, G. L., Brass, W., Moore, R. A. *Ibid*, 1955, i, 285.
21. Archibald, H. M., Bruce-Chwatt, L. J. *Ibid*, p. 970.
22. Bezon, A. *Méd. trop.* 1955, **15**, 423.
23. Beutler, E., Dern, R. J., Flanagan, C. L. *Brit. med. J.* 1955, i, 1189.

at least 16 deaths per 100 births from malaria before the age of reproduction, and all of those who died would be non-sicklers. Thus, if there were in all 50 deaths per 100 births before the reproductive age, then at least a third of these would be non-sicklers dying of malaria.

Turning to work ahead, Dr. NEEL suggested that the most urgent task was an intensive study of small homogeneous populations, preferably whole villages, at widely scattered points throughout Africa, in both malarial and non-malarial areas. The data needed were the age-structure of the population, the frequency of sickling at different ages, the occurrence and density of malarial parasitæmia, the types of marriage (with respect to the sickle-cell gene) and the fertility of these marriages, and finally details about malaria as a cause of death in sicklers and non-sicklers. Tremendous strides were being made in the control of malaria, and in a very few years the opportunities for making these critical studies might be very much less. There was here a better chance, Dr. NEEL concluded, to explore the concept of balanced polymorphism than in any other situation in any other species.

Annotations

R.C.S. IN MANCHESTER

THE first provincial meeting of fellows and members of the Royal College of Surgeons of England is to be held in Manchester on Saturday, Dec. 10. It is a new venture for the college to hold such a meeting outside London. The scientific part of the programme includes, in the morning, clinical demonstrations in the outpatient department of the Royal Infirmary, and, in the afternoon, a symposium on malignant disease, at which Prof. Digby Chamberlain will take the chair and Prof. Geoffrey Hadfield, Prof. Ian Aird, Sir Stanford Cade, and Dr. Douglas French will speak. After tea there will be the annual meeting of fellows and members, the agenda of which will appear in our advertisement columns next week; and a dinner in the University ends the day. The demonstrations and the symposium have been designed to attract not only surgeons but general practitioners and other specialists too; and the college council hopes that a great many members and fellows will be in Manchester for this important occasion.

PREVENTION AND THE PRACTITIONER

As the various aspects of medical practice come under scrutiny, the preventive side is highlighted with increasing frequency. In the *Medical World Newsletter* for October, "G.P. Observer" describes the opportunities for preventive work that come the way of the family doctor, and points out that contact with other workers is needed to enable him to make the best use of them. The practitioner who recognises these opportunities will go out of his way to make such contact; but one has to admit that, as things stand at present, the practitioner to whom prevention means little is unlikely to suffer in reputation for that reason, since unfortunately few patients will expect preventive teaching from him.

Nowadays many more medical officers of health are taking steps to help the family doctor who is prepared to emphasise prevention: some do this by the loan of a health visitor to work with the doctor in his practice, while others encourage his participation in their clinic services. At the welfare centre the general practitioner can meet his colleagues, and while he may learn from the clinic staff much that did not form part of his curriculum as a student, he can in return advise and teach on facets of health care not normally encountered within the clinic walls. There are in fact many clinics—pædiatric, antenatal, child-guidance, and the like—where the differing experiences of general practice and clinic meet and fuse; and the value of clinic premises to the community that pays for them could be increased by broadening their use. More group teaching for young and old, group discussions, group psychotherapy, lectures, and courses could be undertaken if full advantage were taken of the teaching potential of the practitioners in the clinic area. Perhaps some would need instruction in how to teach, but it should not be beyond the capacity of public-health departments to provide such instruction, for which their clinics provide both opportunity and material.

It will always be true, however, that the premises on which preventive medicine will show its greatest return are the homes of people, whether sick or well. It must not be long before the health visitor and the family doctor work in close touch with one another, with mutual responsibility, in the doctor's consulting-room and in the homes of the patients. Health, as well as charity, may be truly said to begin at home.

ULTRA-FINE STRUCTURE OF COLLAGEN

ELECTRON microscopic study of the ultra-fine structure of collagen is being keenly pursued. The unit fibril, about 1000 Å wide, of indefinite length and with a regular transverse banding at 640 Å intervals,[1] is now generally accepted as the characteristic electron microscopic picture of this material. By the usual techniques teased collagen fibres are used and the individual banded fibrils appear as ribbon-like or cylindrical structures. With the introduction of microtomes capable of cutting sections down to 0·02 μ thick, electron microscopists have been able to study collagen in ultra-thin sections. Wyckoff [2] using this technique, found that when the fibres were cut obliquely their appearance resembled tubes rather than cylinders. Kennedy,[3] at the U.S. National Institute of Dental Research, using transverse and longitudinal sections of various sorts of collagen from both man and the monkey, has obtained convincing pictures of the tubularity of the individual fibrils. Detecting the hollowness of the fibrils has been especially difficult because of the large amounts of adherent ground-substance obscuring the microscopic detail. This impediment was successfully overcome by prolonged washing of the specimen in water immediately after fixation in formaldehyde. In some of the obliquely cut fibres the 640 Å banding could be detected on the inside of the lumen as well as on the fibre surface.

The structure of the individual collagen fibre seen under the electron microscope has been further degraded by mechanical, chemical, and enzymatic methods and various possible subunits have been detected. Any of these methods, but especially the use of collagenase, yields, in addition to the usual type of parallel-sided blunt-ended fibres, a much smaller narrower unit which tapers at each end but still shows the characteristic transverse striations. These have been named tactoids, and Keech [4] suggests that the collagen fibre is built up of these units dovetailed together so that their striations are all in register. Her beautifully illustrated paper indicates moreover that the surfaces of junction between adjacent tactoids are probably areas of weakness in the fibre particularly susceptible to the disintegrating action of collagenase. Her illustrations show two further possible subunits liberated by the action of this enzyme—namely, beaded fibrils and the individual beads composing them. These

1. Hall, C. E., Jakus, M. A., Schmitt, F. O. *J. Amer. chem. Soc.* 1942, **64**, 1234.
2. Wyckoff, R. W. G. *In* Connective Tissues: Transactions of the 3rd Conference, Joseph Macy, jun., Foundation. New York, 1952; p 38.
3. Kennedy, J. J. *Science*, 1955, **121**, 673.
4. Keech, M. E. *Ann. rheum. Dis.* 1955, **14**, 19.

beads, with a diameter of 250 Å, are claimed by Keech to be the smallest collagen unit so far detected by electron microscopy.

The ultra-fine structure of collagen is thus gradually being revealed, but the forces that organise and hold together the individual molecules in the form of a banded fibre are almost unknown. We are still ignorant as to whether the banded fibre is built of one form of molecular species, or whether the collagen molecules or aggregates are "cemented" together in the fibre by a non-collagenous cement substance. The action of collagenase in dissolving collagen without the liberation of free amino-acids or small peptides suggests the latter possibility, but whichever structure proves correct the forces responsible for the in-vivo stability of collagen are a matter of paramount importance to students of the connective-tissue diseases.

CANCER OF THE THYROID

In this country deaths from cancer of the thyroid number only a fraction of 1% of all cancer deaths. But in some respects we know more about this form of malignant disease than we do about other cancers, and it is therefore of great theoretical importance. It differs from most other cancers in three respects. Firstly, it displays a remarkable range of malignancy, from highly anaplastic growths which are fatal within a few months of diagnosis to forms scarcely distinguishable histologically from normal thyroid tissue which may continue for many years (even after they have metastasised) without apparently doing the patient any great harm. Secondly, animal work has defined the conditions which lead to the appearance of thyroid neoplasms and has shown that these are to a large extent under hormonal control. Thirdly, it is the only form of cancer which has been effectively attacked by internal radiation from an artificial isotope, and it has therefore provided a testing-ground for this new type of therapy. All these aspects were brought out at a discussion of the Royal Society of Medicine's section of surgery on Nov. 2. Contributions from a pathologist, a physician, and a radiotherapist joined with those of the surgeons to give a complete picture of the disease.

Reviewing the experimental conditions which have been shown to cause thyroid tumours in rats, Dr. I. Doniach included iodine-deficient diets, anti-thyroid substances, subtotal thyroidectomy, and radioactive iodine. Some of these factors were synergistic; for example, radioactive iodine plus an anti-thyroid substance caused more tumours than either alone. Dr. Doniach pointed out that the factor common to all experimental conditions leading to tumour production was a high level of pituitary thyroid-stimulating hormone (T.S.H.) in the blood. This hormone stimulated normal thyroid cells to increase in size and numbers; but apparently occasional cells responded abnormally by tumour formation. The simultaneous administration of a carcinogen appeared to increase the number of cells which responded in this abnormal way; and radio-iodine might do the same. Thus, for the production of thyroid tumours the stimulus provided by T.S.H. seemed to be required, and there might also be an as yet undefined change in the nature of the cells which were stimulated. In rats the conditions which caused benign thyroid tumours to appear, if continued long enough, were usually associated with frankly malignant tumours giving remote metastases. The factors governing the change from a benign to a malignant tumour were not well understood and might repay further investigation.

These conclusions can to some extent be applied directly to human pathology. Broadly speaking, anything which causes simple goitre will tend also to cause carcinoma of the thyroid. This accords with the well-known clinical observation that a large proportion of thyroid carcinomas arise in previously goitrous thyroids. Doniach pointed out that the death-rate from thyroid carcinoma used to be much greater in Switzerland than in this country. With the introduction of iodised salt in Switzerland it was now falling towards the level in Britain. As we suggested recently,[1] the most practical method of reducing the incidence of thyroid carcinoma in this country would be to encourage the widespread use of iodised salt.

Dr. Doniach also quoted recent experience in America which showed that irradiation of the infant's thyroid by X rays directed at the neck or thymus has been followed, in an unpleasantly large proportion of cases, by thyroid carcinoma in later childhood. On the other hand, no cases of carcinoma have as yet been reported after the treatment of thyrotoxicosis by radioactive iodine. It may be that the infant thyroid is peculiarly susceptible to the effects of irradiation. In the present state of knowledge it seems very unwise to expose young children's thyroids to irradiation, whether from X rays or artificial isotopes.

Current opinion on the best treatment for established thyroid carcinoma was crisply summarised by Mr. Selwyn Taylor. Treatment must vary with the histology of the tumour. Those which were predominantly papillary were most commonly found in children, they metastisised to local lymph-glands, and they had a good prognosis. If possible, treatment should be purely surgical, for if the primary tumour (which was often quite small) and the affected lymph-glands could be completely removed the chances of recurrences were remote. Follicular adenocarcinoma usually arose in those of middle age, it was appreciably less benign, and it usually spread by the blood-stream, with metastases in the lungs and bone. Here the surgeon's task was to remove the normal thyroid and as much as possible of the tumour. These conditions prepared the way for possible treatment with radio-iodine, which was more likely to be useful in this group than in any other. Finally, there were the undifferentiated carcinomas, usually found in the elderly, and usually rapidly fatal. Here the most hopeful line of treatment was external radiotherapy, for, as Windeyer pointed out, about half of them showed a useful response to X rays.

Describing treatment with radioactive iodine, Dr. E. E. Pochin said that cases were first selected on a histological basis. Undifferentiated carcinomas seldom took up radio-iodine to a useful extent, and they were therefore not accepted for treatment except as a last resort, when all else has failed. Of the more differentiated types a few would take up appreciable amounts of radio-iodine even when the normal thyroid was still present; but this response was so unusual that total ablation of the normal part of the thyroid should be the first step in this form of treatment. The ablation should preferably be surgical for this saved time, but if this was impossible an ablation dose of radio-iodine was given. The normal gland was always more avid for radio-iodine than the growth, and in addition the tumour's uptake was itself enhanced by the high level of T.S.H. which was associated with clinical myxœdema. Thereafter doses of about 150 ml. of radio-iodine were given every few months. Thyroxine could be given between doses to relieve the discomforts of myxœdema, but it must be stopped a month before the next dose of radio-iodine was due. In successful cases the uptake by the tumour mass gradually decreased and the interval between doses could be increased. The whole procedure commonly took about two years.

The success of this novel form of treatment cannot yet be assessed in terms of survival-rates, for the natural course of these differentiated tumours is very variable and they may be surprisingly benign. But there is no doubt that immediate clinical improvement can often be achieved, with objective evidence of regression of

1. *Lancet*, July 16, 1955, p. 125.

tumour masses. A possible theoretical limit to what can be achieved might be set by observing the selective action of the irradiation on populations of tumour cells. Radio-iodine will tend to eliminate first those follicles which concentrate it best, and also those cells which are most radiosensitive. This selection might change a sensitive tumour which initially had a high uptake into an insensitive one with a poor uptake. The length of the treatment would favour a selective mechanism of this sort. Fortunately there is not much evidence that unfavourable selection actually takes place, for decreasing uptake by a tumour is usually associated with clinical improvement rather than deterioration. It is, in fact, difficult at present to define the factors which limit the success of this treatment. The importance of the problem extends beyond the actual treatment of a relatively small number of patients with thyroid carcinoma. For it is by no means improbable that a chemical substance will eventually be found which is selectively concentrated by cancer cells in general. A radioactive isotope could be introduced into such a substance and would be carried with it into the malignant cells. The experience gained with radio-iodine could then prove very valuable in showing the most effective way of using a substance of this sort.

XERORADIOGRAPHY

SINCE our first reference [1] to this subject two notable British papers have appeared. Oliphant [2] has discussed the design of the first British xeroradiography unit suitable for hospital use, and Hills, Stanford, and Moore,[3] working with this machine, have investigated the qualities of xeroradiographs.

Xerography is a system of photography in which no wet chemicals are needed to develop the image. It depends on the properties of a group of substances known as semi-conductors (selenium is one) which act as insulators in the dark, but become conductors when exposed to light. A thin layer of selenium on a metal plate is given a positive electrostatic charge in a light-tight chamber and is later exposed in the normal way. The charge is reduced by light or X rays falling on the plate, and the image is made visible by spraying the surface with a fine powder, which adheres according to the amount of the residual charge. The xeroradiograph is rather like an etching, and is viewed by reflected light. Its most striking difference from a conventional film is the presence of both bone and soft-tissue detail on the same plate. The powder tends to concentrate along the edges of areas of residual charge, thus increasing the contrast between two densities to a degree that is out of proportion to the actual difference in radio-opacity.

Hills et al. have studied the variable factors in xeroradiography—namely, charging, exposure, and development times. They found that for any given plate the charging time was the most critical—under-charging reduced detail, over-charging caused distortion. The latitude in charging was small if distortion was to be avoided. There was a fairly rapid loss of charge from a plate immediately after charging; this soon became a slow uniform loss and made it difficult to get comparable results. Both exposure and development times were not critical, and a 25% variation in development time was not unacceptable. Hills et al. found that the enhancement of contrast due to the aggregation of powder along the margins of varying densities, and the fairly low over-all contrast between bone and soft tissues, were occasionally a help (e.g., in showing up small cracks in bone); but in general detail was better in a conventional film. Though it was difficult to assess speed, the xerograph needed two and a half times the exposure for non-screen film and up to ten times the exposure for screen films in the thicker areas of the body. Hills et al. concluded that the high tube-loadings and patient-dose restrict the use of xeroradiography, in its present form, to examination of the limbs; but even at present it can, under certain circumstances, equal the qualities of the conventional radiograph and can be an advantage when not all the films taken need be kept. It would be interesting to know what xeroradiography can do with high-kilovoltage techniques.

1. *Lancet*, 1955, i, 957.
2. Oliphant, W. D. *Brit. J. Radiol.* 1955, **28**, 543.
3. Hills, T. H., Stanford, R. W., Moore, R. D. *Ibid*, p. 545.

DEFENCE OF RESEARCH

Humanity's Rising Debt to Medical Research was the subject of Sir Henry Dale's Stephen Paget lecture to the Research Defence Society on Wednesday, and he was able to show how astonishingly the debt has increased even since he gave his previous Stephen Paget lecture in 1931. Demonstrating repeatedly that most of the progress of medicine would have been impossible without experiment on animals, Sir Henry recalled how Ehrlich had to abandon his attempted chemotherapy of malaria because "nobody could consider the subjection of human patients, even if they had been regularly available, to systematic trials of the curative properties of an indefinitely long series of new and untested substances." The present prospect of ridding the world of malaria dates from the decision, 35 years later, to test possible remedies on the malaria-like infections of small birds. Similarly the chemotherapy of bacterial infections, which in 1931 was generally considered impracticable, dates from 1935, when Domagk "found the right kind of septicæmic infections in mice for the testing of potential remedies, and a synthetic substance which, when so tested, was found to have a clear therapeutic action." The application of Fleming's great discovery might have been indefinitely postponed if Florey and his team had not made a new and thorough investigation of the properties of penicillin with the help of an adequate series of experiments on living animals; and everybody should understand that further exploration "in this still productive field of life-saving and healing possibilities" could still be delayed or halted by any successful attempt to hinder or prevent such experiments. Describing the improvement of anæsthesia, Sir Henry complained, with reason, that "the essentially humane researches . . . on which all these beneficent advances are based, are still exposed to a cruel campaign of denunciation and obstruction, the best that can be said for which is that, hitherto, it has been so largely ineffective." One can feel a measure of respect, he said, for people whose imaginative sympathies lead them to reject medical service altogether, and to exclude all animal products from their food and clothing—though even such people must be prepared to answer a charge of cruelty by omission, when they refuse the chance of survival, or the relief of pain, for children and others for whose care they are responsible. But he had nothing but hard words for those who, without attempting such consistency, try to persuade or frighten the ignorant into refusing to be protected by immunisation, or use misrepresentation to prevent experimental research, whether this is for the benefit of man or of animals. The cruelty of these activities is, in Sir Henry's opinion, "none the less detestable on account of its origin in a self-indulgent sentimentality"; and he urged his hearers to counter it by joining the Research Defence Society, founded to fight the battles of the men and women who are doing medical research. The society's office is at 11, Chandos Street, Cavendish Square, London, W.1.

Major-General W. A. D. DRUMMOND, C.B., F.R.C.S., has been appointed director-general of Army Medical Services, from April, 1956, in succession to Lieut.-General Sir Frederick Harris.

Special Articles

THE USE AND LIMITATIONS OF CORTISONE IN GENERAL PRACTICE *

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HITHERTO in this country cortisone and hydrocortisone have been available for use in hospitals only, but now the Ministry of Health are making these compounds freely available to general practitioners. This freedom of control is viewed with apprehension by some hospital workers, who have come to appreciate the value of cortisone in the control of many diseases—in some of which its effect may be life-saving—but who are now also familiar with its limitations and potentially dangerous side-effects. General practitioners for their part may rightly hesitate to use an agent with which, through no fault of their own, they have had little first-hand experience. Nor is it easy to offer them guidance, because the value of cortisone as a therapeutic agent is still under investigation. What is written today may well need modification tomorrow, and if this account of the uses of cortisone errs on the side of conservatism it is because I have deliberately chosen to avoid speculative claims.

The Material Available

Cortisone and hydrocortisone are manufactured synthetically and are stable compounds which may be stored at room-temperature without any special precautions. In man hydrocortisone is the chief secretory product of the adrenal glands, and cortisone is not formed in significant amounts. Given by mouth or injection cortisone is converted in the body and has a similar action to hydrocortisone, although the equipotent dose of hydrocortisone is about four-fifths that of cortisone. Cortisone is ineffective when applied topically for the treatment of skin diseases or injected intra-articularly for the relief of arthritis, and for these purposes hydrocortisone must be used. In all other circumstances, including the local treatment of eye diseases, cortisone and hydrocortisone are interchangeable.

These compounds are available in several different forms and the following are the most likely to be used by the general practitioner:

1. Tablets of cortisone acetate, each containing 25 mg. and scored to give 12·5 mg.
2. Tablets of cortisone acetate, each containing 5 mg.
3. Cortisone acetate 1% eye ointment.
4. Cortisone acetate 1% eye drops.
5. Tablets of hydrocortisone, each containing 20 mg. and scored to give 10 mg.
6. Hydrocortisone acetate 1% and 2½% topical ointment.
7. Hydrocortisone acetate 2½% eye ointment.
8. Hydrocortisone acetate 1% eye drops.

Side-effects

Before discussing the indications for treatment with cortisone, it is necessary to describe its side-effects. Cortisone is a hormone; and given in the dosage required for the treatment of such conditions as rheumatoid arthritis, it may produce side-effects which are potentially dangerous. The therapeutic use of cortisone calls for a balance between the beneficial effect on the one hand and the undesirable side-effects on the other.

Adrenal Suppression

Cortisone suppresses the anterior pituitary gland and thereby diminishes the secretion of corticotrophin (A.C.T.H.). Deprived of the stimulating action of corticotrophin, the patient's own adrenal glands go into a resting phase and become physiologically (but not irreversibly) atrophic. If cortisone treatment is stopped suddenly there may be a delay before the adrenal glands respond to the patient's own corticotrophin, and during this time he is in danger of acute adrenal insufficiency. This explains the sudden unexpected deaths when cortisone treatment has been stopped suddenly. It is essential when ending the treatment to tail off the dose gradually over a period of a week, thereby allowing the pituitary to secrete corticotrophin again and the patient's own adrenals to respond to this corticotrophin.

The other side-effects of cortisone are similar to the features found in Cushing's syndrome. These cannot be termed toxic effects because they are the normal bodily responses to excessive amounts of adrenocortical hormones. The development of these undesirable side-effects is closely related to the dose of cortisone and, to a lesser extent, the duration of treatment; hence the necessity for the maintenance dose to be as small as possible. Sometimes in the treatment of potentially fatal diseases it is impossible to avoid producing side-effects, and the disadvantages of these must be weighed against the fact that without treatment the patient would die. Similarly in selected cases of rheumatoid arthritis or asthma minor side-effects may be tolerated if an otherwise incapacitated patient is able to resume work. The further side-effects are listed here, as far as possible, in order of frequency.

Moon Facies and Obesity

Mooning of the face, and obesity of the trunk and neck with sparing of the limbs, are common early side-effects. In some patients acne and hirsuties of the face develop, and if the dose is large enough purple striæ appear on the flanks and upper part of the thighs.

Electrolyte Disturbances, Œdema, and Hypertension

Cortisone is a relatively weak sodium-retaining hormone, but in large dosage, particularly if renal function is impaired, it causes retention of sodium, œdema, and hypertension. It also promotes loss of potassium from the body, and prolonged treatment may induce muscular weakness. Thus if a patient is having continuous therapy with doses of 75–100 mg. daily it is usual to prescribe a low-sodium diet and 2–3 g. potassium chloride daily in enteric-coated capsules.

Infections

The bodily responses to bacterial infections are altered by cortisone, and the patient is more prone to boils and other septic conditions. To a greater or lesser degree, depending on the dosage, the local and systemic reactions to infection are masked. Thus instances have been reported of patients on large doses of cortisone in whom an acutely inflamed appendix has perforated and peritonitis has developed without significant pain and without any of the usual physical signs. There is a special risk of quiescent tuberculous foci being reactivated, and except in an emergency no patient should be given cortisone without a preliminary radiographic examination of the chest.

Peptic Ulcer

Dyspepsia and peptic ulceration may develop, and there are instances of gastric or duodenal perforation in patients under treatment with cortisone. Some workers have sought to prevent this by prescribing antacids and a gastric-ulcer dietary régime in all patients on prolonged treatment; others prefer to adopt such measures only if dyspepsia develops.

Glycosuria

Large doses of cortisone may cause glycosuria and induce a diabetic glucose-tolerance curve. Ketosis is

* Based on a lecture given in a refresher course for general practitioners held at St. Peter's Hospital, Chertsey, on Oct. 13, 1955.

rare; and unless the glycosuria is severe and causing polyuria it can be disregarded. The insulin requirements of diabetic patients are increased by cortisone.

Osteoporosis

Prolonged treatment with cortisone causes a gradual loss of protein-nitrogen from the body; and in some patients, particularly those more or less immobilised by rheumatoid arthritis, the resulting osteoporosis may cause backache and result in spontaneous fractures of the ribs, femur, or vertebræ. This tendency to nitrogen loss is partly offset by enhanced appetite.

Mental Disturbances

An increased sense of well-being and even some euphoria are common in patients receiving cortisone. There may also be insomnia associated with increased mental activity. In some, particularly those who were mentally unstable before treatment was started, frank psychosis may develop; whether this takes the form of mania, depression, or schizophrenia appears to depend on the patient's constitutional make-up. The mental disturbance usually subsides when treatment is stopped, but may require admission to an observation ward. Patients must, therefore, be strictly supervised and the dose reduced at the first sign of any mental aberration.

Thrombosis

Patients receiving cortisone have an increased liability to thrombosis of the calf veins, particularly if confined to bed.

Contra-indications

The contra-indications to the use of cortisone can be inferred from its side-effects. They are as follows:

1. Cardiac failure, unless due to acute rheumatic fever. Cortisone should be administered cautiously to patients with hypertension.
2. Chronic renal failure with a raised blood-urea level.
3. Infection uncontrolled by antibiotics.
4. The presence of a peptic ulcer, or a previous history of peptic ulcer, hæmatemesis, or melæna.
5. Any past or present mental instability.

Perhaps the most important contra-indication is the absence of one of the established indications for its use. Cortisone should not be the last resort of the therapeutically destitute.

Indications

Many different disorders, seemingly unrelated in ætiology and clinical manifestations, respond favourably to cortisone. These may be divided into two distinct groups. In the first are diseases that are characterised by failure of the patient's own adrenal glands to secrete sufficient hormone, and which respond to substitution therapy with cortisone in physiological amounts. In the second group are a large number of disorders not associated with any adrenal abnormality which respond to cortisone in much larger—so-called pharmacological—dosage. Replacement therapy in patients with adrenal insufficiency is logical. Pharmacological dosage—for the relief of rheumatoid arthritis, for example—is less readily understandable, but the benefit is due largely to the anti-inflammatory action of cortisone.

Except perhaps in cases of certain skin diseases, practitioners may wish to seek expert advice before prescribing cortisone. Certainly it should not be prescribed until the diagnosis is sure; and in many of the conditions where it is of value the diagnosis can be substantiated only by radiography and laboratory investigations—for which the patient must usually be referred to a hospital. But practitioners will wish to play their part in the treatment of patients who have been discharged from hospital on continuous cortisone therapy.

Physiological Dosage

Addison's Disease

Patients whose adrenal glands have become atrophic or have been destroyed by tuberculosis derive great benefit from replacement therapy with cortisone. Their sense of well-being is improved, they are no longer liable to hypoglycæmia, and they regain lost weight. According to the degree of adrenal insufficiency, 12·5 mg. cortisone acetate once, twice, or thrice daily is required. The same substitution therapy—usually 25–50 mg. daily, spaced evenly throughout the day—is given to patients whose adrenal glands have been excised in order to retard the growth of inoperable carcinoma of the breast or prostate, or in the treatment of Cushing's syndrome. This replacement therapy suffices for the exigencies of every-day life, but in subjects with normal adrenal glands any stressful situation will evoke increased adrenocortical activity, and the patient with Addison's disease requires additional replacement therapy when exposed to untoward events ranging from a heat-wave or minor motor-car accident to a visit to the dentist or a surgical operation however minor. Thus the patient should be given an emergency supply of cortisone with instructions to take an additional 2–8 tablets (50–200 mg.) daily according to the severity of the stress. In physiological dosage the salt and water retaining action of cortisone is not great. Although all patients with Addison's disease improve greatly with cortisone alone, deoxycortone acetate, deoxycortone trimethylacetate, or fluorohydrocortisone may have to be given in addition to restore to normal the blood-pressure and sodium and potassium balances. Here fluorohydrocortisone is particularly valuable because it is effective by mouth and as little as 0·25–0·5 mg. on alternate days or every third day is often sufficient.

Panhypopituitarism

In the same dosage cortisone provides rational substitution therapy for patients whose adrenal glands have atrophied owing to destruction of the anterior pituitary gland. This is usually caused by infarction of the pituitary after severe obstetrical hæmorrhage (Sheehan's syndrome), but it may result from pressure by an intracranial tumour. In these patients cortisone prevents attacks of hypoglycæmia and coma; its effect is no less satisfactory than in Addison's disease.

Acute Adrenal Insufficiency

Acute adrenal insufficiency arises rarely as a complication, particularly in children, of overwhelming infection with streptococci or meningococci. The clinical picture is that of the underlying infection, together with sudden collapse and a precipitous fall in blood-pressure and other manifestations of shock. Replacement therapy with cortisone or hydrocortisone, in addition to large intramuscular doses of penicillin to combat the infection, may be life-saving. If possible an intravenous infusion of 100–200 mg. hydrocortisone † in glucose-saline should be given together with an intramuscular injection of 100 mg. cortisone acetate. Thereafter if the child is not vomiting, cortisone may be given orally in divided doses amounting to 100–300 mg. daily according to the body-weight and clinical response.

Pharmacological Dosage

In the many seemingly unrelated conditions where adrenal hormones are of value when given in an amount greater than that required physiologically, their beneficial action is probably due to their strengthening the cell membrane and altering cellular permeability. The result is reflected most conspicuously in their anti-inflammatory action.

† Hydrocortisone (free alcohol)—so called because the steroid is not in the form of the acetate ester—is available as a sterile solution for intravenous administration in ampoules of 20 ml. containing 100 mg.

Inflammation is usually associated with a local response (the outpouring of cells and fluid from dilated capillaries) and a general systemic response characterised by such features as malaise, fever, and increased erythrocyte-sedimentation rate (E.S.R.). In the case of a bacterial infection the local reaction is designed to confine and eventually destroy the invading organisms. The function of the systemic disturbance is less clear, but at least it indicates that the patient is ill. Given in large doses—in pharmacological as opposed to physiological amounts—cortisone prevents both the local and the general inflammatory responses.

If, for example, a patient with lobar pneumonia were given cortisone in large amounts, the temperature would settle, the E.S.R. would decrease, and from feeling ill he would have a sense of well-being and even some euphoria. These improvements would give the erroneous impression that the drug was doing good. On the contrary the infection in the lung would be spreading, and cultures of blood for pneumococci would be repeatedly positive. Clearly under these circumstances cortisone is merely masking the outward manifestations of the infection.

In rheumatoid arthritis the local inflammatory reaction seems to serve no useful purpose and is responsible for the pain, swelling, and tenderness of the joints. Here cortisone relieves the symptoms by suppressing the local and general responses, but it does not cure the underlying disease process. This effect has been likened to an asbestos suit which protects the wearer from the heat and flames but does not put out the fire. There is always the hope, however, in a self-limiting disease that the fire will go out spontaneously or that some other treatment will extinguish it.

Dosage

The effect of cortisone lasts for about six to eight hours, and therefore the dosage should be spaced evenly throughout the day. Dosage can be determined by no rule-of-thumb, and the management of acute, potentially fatal diseases is quite different from that of lengthy chronic illnesses. In acute fatal diseases the aim is to suppress the condition by an initially high dosage—200–300 mg. on the first day and 100–200 mg. in divided doses on the second and third. Thereafter the amount is adjusted carefully until it just suffices to control the manifestations. Since the disease is potentially fatal, the dose is governed by the severity of the condition rather than by concern over the development of side-effects. In chronic non-fatal conditions, on the other hand, the aim is to provide optimal, not necessarily maximal, relief. The dosage is governed more by the risks of undesirable side-effects than by the severity of the symptoms.

Collagen Diseases

Cortisone is especially useful in controlling the collagen diseases, of which rheumatoid arthritis is the commonest.

Rheumatoid Arthritis

The problem here is to decide at what stage in this protracted disease cortisone should be administered. Trials organised by the Medical Research Council have shown that in the early stages, when spontaneous remissions are common, cortisone relieves symptoms no better than aspirin. In cases of longer standing, not controlled with aspirin, other drugs, such as phenylbutazone, may be tried, but it is for these that cortisone has been most used. Treatment may have to be prolonged; and before it is begun the contra-indications to its use must be carefully considered, for it is easier to start than to stop administering cortisone.

Cortisone is of particular value in cases where soft-tissue swelling, inflammation, and pain are not controlled by aspirin. It is also indicated in that acute type of rheumatoid arthritis associated with pyrexia which initially may mimic acute rheumatic fever but does not respond to salicylates. It is useful, too, during active rehabilitation and in an acute exacerbation of chronic disease.

After an initial dosage of 75–100 mg. cortisone daily for several days the patient's symptoms gradually subside. Pain and tenderness of the joints and stiffness diminish early. Peri-articular swelling is reduced more slowly and less certainly. The patient has an improved sense of well-being and renewed optimism for the future after weeks or months of discomfort and perhaps unemployment. As soon as the symptoms have been controlled the dosage is reduced gradually—using 5 mg. tablets if necessary—to the least which affords the patient reasonable comfort. Commonly the dosage required to maintain the patient completely free of symptoms is large and therefore likely to cause progressive side-effects. The aim should not be to free him of all discomfort, but to improve his condition substantially without producing significant hypercortisonism. The severity of the disease fluctuates, and the dosage of cortisone should be adjusted in parallel. Maintenance dosage—the amount required to maintain notable but incomplete symptomatic relief—varies between different patients; but if progressive side-effects are to be avoided it should usually not exceed 40–75 mg. daily in men, 30–50 mg. in premenopausal women, and 25–37·5 mg. in postmenopausal women. Manual workers often have more pain towards the end of the day, whereas in sedentary workers the pain may be worse in the mornings. Thus, although the intervals between doses of cortisone should be regular, the amount given may be varied to accord with diurnal variations in symptoms. By this means patients have been treated for long periods without the development of significant side-effects. If a partial or almost complete remission occurs, the dosage of cortisone should be tailed off gradually and the patient maintained on aspirin, cortisone being kept in reserve for the treatment of any subsequent exacerbations.

Cortisone must be used only in the active phases of the disease when the symptoms are due to an acute inflammatory reaction. It will not influence deformity or ankylosis, and should never be given in the later stages when the disorder is largely burnt out and the patient's disability is due more to immobility and stiffness from disorganisation of the joints than to pain and malaise from inflammation.

Rheumatic Fever

Cortisone relieves the joint pains and pyrexia of acute rheumatic fever. A similar result often follows administration of aspirin; the Medical Research Council trial showed that for relief of symptoms these two drugs were about equally efficacious. Nevertheless in individual cases cortisone may be more effective than aspirin, and there is increasingly good evidence from America that there is less likelihood of residual valvular damage after prolonged (six to twelve weeks) treatment with large doses of cortisone than after treatment with aspirin. The development of valvular and myocardial lesions is not closely related to the severity of the acute rheumatic attack, and hence there may be a place for cortisone in mild as well as severe cases. This matter is still sub judice; but cortisone is certainly indicated in severe cases, particularly if pericarditis or heart-failure develop.

Other Collagen Diseases

At present cortisone is the only drug that offers any hope in *disseminated lupus erythematosus*.

This rare, but increasingly recognised, disease usually occurs in women aged 20–40 and is characterised by some or all of the following features: arthralgia (indistinguishable from that in rheumatoid arthritis); fever; pleural, pericardial, or abdominal effusion; Raynaud's phenomenon; lymph-node and hepatic enlargement; butterfly rash over the cheeks and

bridge of the nose; progressive anæmia, leucopenia, and thrombocytopenia (which may be associated with purpura or hæmaturia); and renal involvement. The diagnosis is confirmed by detection of the so-called lupus-erythematosus cells in the plasma.

Provided treatment is instituted before there is renal involvement (which invariably leads to fatal uræmia), cortisone will often control the disease and maintain a remission for months or years.

Cortisone has also proved of value in some cases of *periarteritis nodosa, dermatomyositis, scleroderma, ankylosing spondylitis, and temporal (cranial) arteritis.* It is particularly indicated in cases of severe temporal arteritis where constitutional symptoms are prominent and the patient is in danger of losing his sight.

Skin Diseases

Pemphigus and Exfoliative Dermatitis

For these conditions, with extensive areas of skin involved, oral treatment with cortisone or hydrocortisone is necessary and has proved life-saving. Formerly *pemphigus* usually ended fatally after six months to two years, but satisfactory remissions have been achieved with cortisone, often in very high dosage; continuous maintenance therapy is nearly always necessary to prevent a relapse. In the pemphigus-like eruptions (pemphigoid, bullous erythema multiforme, and senile dermatitis herpetiformis) the effect is also dramatic.

In *exfoliative dermatitis* the outlook depends on the underlying cause. Dramatic and permanent cures may be achieved when the disorder is due to the toxic action of a drug, such as gold. The idiopathic form also responds, but continuous maintenance therapy may be necessary, the dosage being adjusted to the least which will prevent a relapse. Where the cause is a reticulosis the skin condition will respond, but the prognosis depends on the underlying disease. Erythrodermia following psoriasis is often difficult to control and relapses readily when the dosage is reduced.

In many skin diseases topical application of a 1% hydrocortisone ointment or lotion, sparingly twice daily at the onset and thereafter once daily or on alternate days if control is maintained, has a remarkable effect; and there is no danger of side-effects.

Eczemas, Dermatitis, and Pruritic Conditions

In many of these conditions topical application of hydrocortisone ointment has proved of considerable value. First the underlying cause must be sought, and if possible removed, because the steroid masks the condition but does not cure it—although a spontaneous remission may persist when treatment is stopped. Such intractable and irritating conditions as pruritus ani and pruritus vulvæ may respond remarkably in a matter of hours; but if a satisfactory response is not achieved within four days it is useless to persist with this form of treatment. Infantile eczema, contact dermatitis, atopic dermatitis, and seborrhœic dermatitis may all respond to hydrocortisone ointment. Recalcitrant vesicular eruptions of the hands are, as always, fickle in their response; but eczema of the eyelids, postauricular folds, and auditory canal (chronic otitis externa) are often improved dramatically. Where there is much lichenification the response is less rapid, and a 2·5% ointment may be preferred to the 1%. In all these conditions the more usual types of treatment should be tried first, and hydrocortisone ointment not started until the advice of a dermatologist has been sought.

Cortisone by mouth may also be effective in other skin diseases such as acute lichen planus, acute urticaria, drug sensitivities, and certain forms of alopecia. Here the indications are still sub judice and meanwhile expert advice should first be sought.

Respiratory Diseases

Two respiratory disorders—bronchial asthma and pulmonary sarcoidosis—may respond to cortisone.

Asthma

Cortisone is usually effective and may be life-saving in the treatment of status asthmaticus; but it should not be used until more orthodox remedies, including adrenaline 1 minim a minute injected subcutaneously and intravenous aminophylline, have failed. Large doses (200–500 mg.) are often required initially, but the relief of bronchospasm may be dramatic. Thereafter the dosage is reduced gradually. Any superimposed respiratory infection should be treated simultaneously with an antibiotic—usually penicillin.

The value of cortisone in the treatment of severe and recurring attacks of asthma is still undecided. When other forms of treatment have failed cortisone will usually give temporary relief with remissions lasting for one to two months. At present the consensus of opinion favours repeated short courses of cortisone in these patients, but 40% of patients need continuous maintenance therapy to keep them symptom-free. The undesirable side-effects of cortisone administered over long periods must be weighed against the symptomatic improvement obtained; and as in the treatment of rheumatoid arthritis it is wise to aim short of complete relief. Bronchodilators should be given concurrently; and if the factors leading to the asthma are treated and managed the patient can often be maintained on smaller and smaller doses of cortisone.

Cortisone is not indicated, and is ineffective, in the treatment of bronchospasm associated with chronic bronchitis and emphysema.

Sarcoidosis

A decision to use cortisone in the treatment of sarcoidosis should be made in consultation with a specialist in this field. Its use is indicated in the earlier stages if there is considerable pulmonary involvement. Since it is thought that in many instances the condition is related to a tuberculous infection, antituberculous chemotherapy is usually given concurrently.

Eye Diseases

Cortisone or hydrocortisone eye-drops and ointment are of great value in the treatment of non-bacterial diseases of the eye—particularly iridocyclitis and keratitis. These conditions are often self-limiting; and the ultimate visual damage, as well as the pain, are largely proportional to the intensity of the exudate, which cortisone suppresses. Local treatment should be applied every one to three hours, in addition to the usual instillation of atropine. In keratitis, especially the interstitial keratitis of inherited syphilis, the suppressive effect of cortisone is particularly important since subsequent scarring (and consequent visual loss) is directly proportional to the severity of the intracorneal exudation and infiltration. Pathogenic organisms may be present which require antibiotic treatment. In iritis, cortisone is especially indicated if there is an unusually heavy exudate into the aqueous which may obstruct drainage and cause a secondary glaucoma. Its use is of the greatest value in sympathetic ophthalmia, in which the prognosis is doubly grave because both eyes are involved.

Cortisone applied locally relieves the manifestations of conjunctivitis, but here its use should be restricted to cases due to allergy which have not responded to antihistamine drugs.

Nephrotic Syndrome

Cortisone is helpful in the management of the nephrotic syndrome, particularly in children. Its effect may be partly related to a decrease in the permeability of the glomerular capillaries whereby the heavy loss of protein

in the urine is reduced. A short course of cortisone may then be accompanied, or followed, by a pronounced diuresis and clearing of the œdema. This treatment should be instituted only in hospital, where the clinical response can be closely observed. Such treatment enhances somewhat the risk of intercurrent infection, but this can usually be controlled by antibiotics. After a remission of several weeks or months the œdema tends to recur; but it often responds to further courses of cortisone, and in some instances lengthy or even permanent remissions are induced.

Blood-diseases

Cortisone has proved of value in several hæmatological disorders, but a precise laboratory diagnosis is necessary and in most instances this will require admission of the patient to hospital.

Thrombocytopenic Purpura

By its action on the capillary walls cortisone reduces purpuric manifestations in thrombocytopenia, whether primary and idiopathic or secondary to some other disease. It is of particular value in bringing acute purpura due to idiopathic thrombocytopenia under control, and thus enabling the hæmoglobin level to be raised enough (perhaps with the help of a blood-transfusion) for splenectomy to be undertaken. Many patients with Henoch-Schönlein purpura improve with cortisone, but the exact rôle of this agent in treatment is still under investigation.

Hæmolytic Anæmias

Hæmolytic anæmias and hæmolytic crises such as may occur in Hodgkin's disease, lymphosarcoma, chronic lymphatic leukæmia, and other malignant conditions may be controlled with cortisone; and similar satisfactory results may occur in other acquired hæmolytic anæmias. The dose of cortisone required varies between different patients, and in the same patient at different times. Sufficient is given to suppress hæmolysis; this suppression is shown by a fall in the serum-bilirubin level and in the reticulocyte-count and by a rise in the hæmoglobin level to 75–80%. But, because of side-effects, the hæmolytic process can seldom be suppressed completely.

Leukæmias and Reticuloses

In the leukæmias and reticuloses the effect of cortisone is on the whole disappointing. In acute lymphatic leukæmia a temporary remission may be induced, but the disease becomes increasingly less responsive with each relapse. Cortisone often reduces the size of the glands in chronic lymphatic leukæmia (without always influencing the number of primitive cells in the peripheral blood) and in lymphosarcoma. This action may be useful in relieving respiratory obstruction due to enlarged mediastinal glands.

Miscellaneous Conditions

Cortisone has been used with some success in a large number of other diseases; but except in *ulcerative colitis* satisfactory responses have not been the rule.

Systemic cortisone is never indicated in patients with *osteo-arthritis*, but in monarticular cases where a large joint is involved intra-articular injection of hydrocortisone will cause symptomatic improvement. This, however, is of short duration—up to ten days—and such an injection should be made only for special occasions. In *acute gout* cortisone relieves the swelling, but a recurrence is likely when treatment is stopped. In most instances orthodox treatment should be used and cortisone reserved for the relief of an acute episode which would otherwise prevent the patient from keeping an important engagement.

The Future

The limitations of cortisone are many. Nevertheless its place in therapeutics is established, and further research into the mechanism of its anti-inflammatory action may reveal much which is now hidden from us. Steroid chemists are engaged in synthesising compounds related to cortisone and hydrocortisone which may prove no less effective or more effective than the present substances and may have fewer side-effects. Already prednisone and prednisolone, analogues of cortisone and hydrocortisone, have been developed. These appear to have an equivalent anti-inflammatory effect at about one quarter the dosage of the parent compounds, but a much diminished tendency to cause sodium retention and œdema. We are on the threshold of a new and important era in the control of some hitherto fatal or disabling diseases.

I am most grateful to several colleagues—particularly Dr. Stephen Gold, Dr. Frank Dudley Hart, and Mr. Patrick Trevor-Roper—who have kindly given advice from their expert experience. I am also indebted to Merck-Sharp & Dohme Ltd., who have freely supplied large quantities of steroids.

GENERAL PRACTICE IN SCOTLAND

AT the end of June this year Scotland had 2568 doctors undertaking to provide general medical services under the National Health Service, compared with 2543 in 1954 and 2505 in 1953. These figures are given in the annual report of the Scottish Medical Practices Committee, which remarks that the average number of patients on doctors' lists was 1975 at the end of this June, compared with 1981 on the same date last year. This average, says the report "tends to suggest that the country as a whole is not suffering from a shortage of general medical practitioners."

Applications for the 22 advertised vacancies numbered nearly 900; but many doctors lodged applications for more than one vacancy, and an appreciable number of applications came from doctors already established in practice. The ages of the selected applicants ranged from 28 to 57, with an average of 39.

The committee suggests that young doctors seeking a post should not look on advertised vacancies as the main or the best method of entry into practice. The second method—setting up a new single-handed practice—seems to be falling out of favour. The committee finds that, even with the encouragement of an initial practice allowance, few doctors are willing to face the hazards involved in building up such a practice, either in a district listed as "under-doctored" or elsewhere. There is too the practical difficulty of securing a suitable place to live in and to work from. Furthermore, most people already on a doctor's list tend to remain on this list unless some change of circumstances necessitates transfer. Before the start of the National Health Service "there was more mobility among patients than there is today, when a person who wishes to change his doctor must make a formal application to the Executive Council."

The committee concludes that probably the most effective method of entry into general practice is by joining in partnership after a preliminary assistantship. "This can be done, however, only with the co-operation of established practitioners, some of whom, it is felt, do not fully appreciate the financial benefits which a partnership brings."

"... In England, where rulers rely, not so much upon the brilliance of individuals as on the solidity of the national character, intellectuals are not expected, and do not expect, to exercise any corporate influence at all. It is only our scientists (a fresh breed of men) who suppose that their opinions on subjects outside their own competence are of importance. This illusion will pass."—Sir HAROLD NICOLSON. *Good Behaviour*. London, 1955; p. 142.

In the Mental Hospital *

GROUP WORK-THERAPY IN HOLLAND

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IN a three-week visit to some of the Dutch mental hospitals I particularly noticed how much value the Dutch attach to group work-therapy for their patients, as opposed to occupational therapy in the sense of practising arts and crafts under the guidance of a trained therapist. In the hospitals I visited the patients' programme was as follows:

6.0 A.M. Dress. Make beds. Help clean ward.
7.0 A.M. Breakfast. Wash up.
8.0 A.M.–12.30 P.M. Work—with a break for coffee or tea at 10.0 A.M.
12.30 P.M.–2.0 P.M. Lunch on the wards.
2.0 P.M.–5.0 P.M. Work, with a break for a cup of tea at 3.30 P.M.
5.30 P.M. High tea on the wards.
7.0 P.M.–8.0 P.M. Recreation, games, dancing, &c.
8.0 P.M. Evening drink.
9.0 P.M. Bed.

Besides the usual work for patients in the kitchens, needle-rooms, and laundries, and on the farms, the hospitals also provide light assembly work, on small electrical fittings, bicycle parts, cardboard boxes, or plastic gadgets, which are sent in by local factories. The factories pay for this work. Rugs and mats made in the hospitals are also sold to the factories. In one hospital which was being redecorated, all the inside painting for a completely new colour scheme in two blocks of wards had been done by patients under the guidance of hospital staff. One hospital of 1200 patients had a farm supplying all the hospital's needs and also selling corn to the local mills. This farm was worked by a farmer and his family of 4 sons, with the help of 30 full-time working patients. The kitchen garden for the same hospital was run by 1 gardener with 20 full-time patients.

Simple occupational therapy is given to patients who are too disturbed or deteriorated to leave the ward, but even with these patients the Dutch try, whenever possible, to substitute some work which is of use to the community. For instance, disturbed patients, men and women, who would formerly have been confined to the wards, are now encouraged to help in the grounds by carting leaves or grass-cuttings in wheelbarrows, or moving earth and sand for gardening purposes.

Members of each working group are encouraged to teach newcomers, rather than leave this to the hospital staff. As they progress some patients are put in charge of others, and each group of 8–10 patients has a leader who is responsible for the team.

Under the guidance of a trained occupational therapist, patients with an aptitude for embroidery and needle-work make all the cushion-covers, tablecloths, aprons, and so on in use in the hospital. In one ward I saw 40 bed-spreads in heavy cotton-lace made by patients, and several others had sets of curtains made from plain material most attractively embroidered by patients.

Individual occupational therapy, such as basketry, leather-work, tapestry, and stool-making, is done as recreation and entertainment in the evening after the day's work is over, or by patients who are confined to bed. Patients who wish to make articles for themselves are helped to do so during this time, and not during "working hours."

Patients are given pocket-money, varying from 2*s.* 6*d.* to 7*s.* 6*d.* per week, which is intended, as in our own hospitals, to show appreciation of the progress made, and to encourage further effort, but not to represent the material value of the work.

By far the greater part of the Dutch patient's day is spent in work which, while carefully chosen to match his ability, is also for the good of the hospital. In many English hospitals the main part of the patient's day is spent in occupational-therapy centres with trained therapists. Here he is helped to make articles, calling at first for only a limited ability and concentration, but for more complicated skills as his condition improves. At the same time he is under the observation of people who are aware of his psychiatric condition and can report on his behaviour to his doctors and nurses. What he makes is made by himself alone, and is usually for his own benefit and pleasure. The community gains little from occupational therapy of this kind, but it helps to restore a patient's self-confidence by proving to him that he can complete a piece of work successfully.

The Dutch also recognise this, but feel that the leisure hours in the evening are long enough for the patient to benefit from individual work. They maintain that their intensive group programme, if carried out by an enthusiastic nursing staff, offers a life which is as normal as possible, and which is a good preparation for the time when the patient will again face the outside world. They attach much importance to the fact that the patient is working, not for himself alone, but with others, in a team, towards an end which benefits the community of which he is for the time being a member. They also believe that by working in a group the patient is trained to accept some responsibility, however little, and to adjust himself to the needs of the community.

A hospital which employs only 1 gardener to tend a kitchen garden serving 1200 patients saves on wages; but does this necessarily mean that the patients are being exploited? Or is it, as the Dutch think, more effective treatment than individual occupational therapy?

My visit to Holland was made while I was taking a course on nursing administration at one of the staff colleges of King Edward's Hospital Fund. I am grateful to the governors of my hospital for enabling me to attend the course.

* A group of articles chiefly concerned with the value of active occupation and work for mental patients and the means whereby it is best provided.

Public Health

Alcoholism in France

THE perils of alcoholism are forcing themselves more and more on the attention of the French government and people. A determined campaign has now been in progress for more than a year to combat what, for its serious effects on public health and even public security, has come to be regarded as an urgent national problem.

As part of far-reaching inquiries (many of them still in their early stage) into the effects of alcoholism, each administrative department in France is now obliged to make statistical returns of the number of patients in psychiatric institutions suffering from alcoholic psychosis, as well as the number of deaths due to cirrhosis and acute alcoholism. Every department whose returns show a "rate of alcoholism" which exceeds the national three-year average is by law required to set up, without delay, one or several institutions for the "re-education of alcoholics." These are either independent centres for 50 to 100 patients or sections attached to a psychiatric clinic or hospital with beds for 25 to 50. They will undertake compulsory institutional treatment.

Among the latest measures taken by the French legislature are a number of decree-laws, passed this summer in execution of the French code of public health, which clarify the conditions and safeguards under which such custodial treatment can be imposed upon alcoholics. These go much further than anything yet contemplated in this country or elsewhere.

All administrative authorities, including the police and the prisons, must now report to the health authorities of

each department every case which comes to their knowledge, either in court proceedings or in any other way, of persons against whom there is "grave and precise" suspicion that they have committed a criminal offence in a state of intoxication, or who might become dangerous to third persons because of alcoholism. Where such people are already in prison, this notification to the health authorities is required at least several days before their sentence expires. Upon such notification the health authority will undertake, within a few days, a general "social inquiry" into the circumstances of the suspected alcoholic; and they will appoint a doctor from a pre-established panel to make a complete medical examination. Powers exist under the public-health code to enforce such an examination in case of need. If the doctor decides that the patient is an immediate danger to public safety, the medical report must be delivered within as short a period as 48 hours. The report will be considered by a permanent medical commission of nine members appointed by the departmental prefect (the quorum is three, of whom at least one must be experienced in psychiatry).

If the commission conclude from the social and medical reports that the suspect is in fact a danger to third persons (regardless of whether he has, or has not, at any time committed a punishable offence), they make a request, accompanied by their reasons, to the local civil court for an order of committal to a re-education centre for alcoholics. While this order itself can come only from a law court, eventual release (which may be on trial and subject to conditions such as regular report at the re-education centre) lies within the discretion of the authorities responsible for the treatment. But the public prosecutor and the departmental director of public health must be informed of all releases. Voluntary patients will also be admitted to these re-education centres and sections, but they must be released immediately upon demand.

This scheme of compulsory custody and treatment for alcoholics is novel in its severity, but it seems fairly widely agreed in France that the seriousness of the situation justifies, and indeed demands, severe measures. For French public opinion has lately been shaken by the views of certain specialists that as much as "75% of all congenital physical and psychological anomalies among young people, including juvenile delinquency, are in some direct way related to alcoholism among progenitors."

On the other hand, the National Assembly last week [1] decided to delay until next September the application of another and much less sweeping decree against alcoholism. This would have deprived about a million Frenchmen of the right to distil 10 litres of alcohol without paying tax on it. The decree was directed against those people who, though not farmers or fruit-growers, had managed to acquire the privilege of getting 10 litres of alochol distilled from their own products. But for reasons which it seems are at least partly political, they will now be able to go on enjoying their bonus until next autumn at any rate.

Poliomyelitis

Uncorrected notifications of poliomyelitis in England and Wales in the week ending Nov. 5 (44th week) were considerably less than in the preceding week—the first indication that the seasonal decline is now well under way. The figures were (43rd week in parentheses): paralytic 154 (189), non-paralytic 105 (140), total 259 (329). But the total was the highest for any 44th week in the past six years. Total uncorrected notifications in the 44th week for the years 1950–55 were as follows (percentage of paralytic cases in parentheses): 1950, 206 (72·1%); 1951, 82 (75·6%); 1952, 86 (75·6%); 1953, 94 (63·9%); 1954, 59 (61·0%); 1955, 259 (59·5%). So far in 1955 the proportion of non-paralytic cases in England and Wales has been about 45·5%. This is a further small drop towards a more usual figure; but it is still higher than any of the preceding four years, for the whole of which the figures were: 1951, 41·5%; 1952, 29·8%; 1953, 34·6%; 1954, 32·8%.

1. *Times*, Nov. 10, 1955.

The Widdicombe File

XXIX. SPECIALIST WITHOUT A SPECIALTY?

DEAR YOUNG PEARSE,

Your father, who sounds (from his letter) to be in his usual tempestuous health, has asked me to drop you a line about Chest Physicians. He tells me, inter alia—much alia very badly written—that you are keen to "take up diseases of the chest as your specialty." The interesting word is the penultimate one; for he implies that there is no question that you should acquire a specialty. We must accept this; but—if you will pardon the cliché—you are still young. Have you so soon decided not to be a general practitioner? Possibly you still believe that medicine is a science and that serum-potassium, cardiac catheters, and corticosteroids are more important than sympathy, kindness, and faith healing. I suspect that your forceful specialist father has had much to do with it.

Now about being a Chest Physician. Your father is rightly anxious about the future of this branch of medicine. There has been talk lately of tuberculosis dying out and Chest Physicians becoming unemployed. Of course, much of it is not meant to be taken seriously, but the idea is worth examining.

I doubt very much whether tuberculosis will die as quickly as some seem to think. The prevalence of the pulmonary variety is still high and shows little inclination to decline. Better feeding, housing, treatment, and chest clinics will undoubtedly harry the bacillus and eventually contain it. But talk of the conquest of tuberculosis and a tuberculosis-free nation within a decade comes only from journalists, surgeons, or enthusiastic physicians who lack the most necessary quality of the wise doctor—humility. Tuberculosis will undoubtedly decrease and may almost disappear, like plague, smallpox, and diphtheria. Your son—as far as I know yet unborn—may on qualifying know as little about tuberculosis as I knew of chlorosis and cholera. But that assumes that you will be able to resist matrimony for another five years and that your first two children will be daughters. Give us, in other words, three decades with no wars or trade depressions, and tuberculosis may become as infrequent as typhoid in this country. A small outbreak will then be a proper subject for a contribution to *The Lancet*; and there will be a sententious leader pointing out the danger of the falling vaccination-rate and the need for continued vigilance, while deploring the premature closing of sanatoria and their conversion to convalescent homes for neurotics.

As tuberculosis declines, the work of the chest physician will change. He used to be a Tuberculosis Officer with the D.P.H. Now he is a Chest Physician with the Membership. But changing his name and his administrative environment has not fundamentally altered his work. He still deals largely with tuberculosis and is not concerned with the other aspects of chest medicine except for differential diagnosis and disposal, the lung cancers and odd shadows going to the thoracic surgeons and the bronchitics and asthmatics back to the general practitioner. If he gets an unusual or especially interesting patient he may have to send him elsewhere because he has no beds. He may even have no beds for his tuberculous patients. The position is getting better, and many Chest Physicians can be chest physicians. That is what I am trying to lead up to. As tuberculosis declines, the chest physician, far from losing his job, should come into his own. He can forget tuberculosis and study the other equally, and in some cases more, interesting diseases that come within his special branch.

Recently, I heard a physician—a very eminent one—say that the study of chest diseases is the only specialty

that is not special. Neurology, for instance, is a pure intellectual exercise in a very restricted field. Diagnosis is all, or nearly all. No doubt it has its excitements. The toe that goes up at the end of a detailed and otherwise normal examination may give as much intellectual satisfaction as the last word in the *Times* crossword puzzle. But, like the puzzle, it is then finished—until the next puzzle, clinical or cross, comes along. Or consider dermatology, an exercise in observation and exact description. It is a voluptuous specialty; for is there not sensuous satisfaction from the rolling Latin names and the elegant powders, paints, unguents, and creams—ectodermosis erosiva pluriorificialis and the Waters of Saturn. Cardiology, once a bedside art, is becoming an exercise in techniques—electronics, sound recording, cardiac catheterisation, and angiography. It is a paradise for those who like gadgets and making things work.

Have you noticed that the study of diseases of the chest is not an -ology? The Americans have tried "phthisiology" and "œsophagobronchology." I have even seen "pulmonology." Maybe the absence of an -ology is merely due to the ugliness of all possible ones. But I like to think that the study of chest diseases is too wide a subject to be constrained by a single -ology. Anatomically all between neck and navel is fair game. Thyroids slip behind the sternum, cystic hygromas invade the mediastinum, subphrenic abscesses give pleural effusions, and the stomach slides into the thorax. The fully equipped chest physician must have, besides an intimate acquaintance with the lungs, a working knowledge not only of the heart, its murmurs, rhythms, malformation, and failures, but also of the mediastinum, œsophagus, diaphragm, and ribs. Moreover, his interest in the lungs takes him far afield into general medicine—to disseminated lupus erythematosus, scleroderma, the lipoidoses, reticuloses, myopathies and neuropathies, poliomyelitis, steatorrhœa, uræmia, and polyarteritis nodosa. Surely such a subject is a generality.

If you were cynical—which I know you aren't—you would retort that the very breadth of the subject denies it a separate existence; that if it embraces so much of medicine it is the proper study of the general physician. But I should reply that the good chest physician is indeed a general physician, with a little special knowledge. The cynic may still object that the chest physician without tuberculosis is like a bishop without a see or a Minister without portfolio—a specialist without a specialty or reason for existence. And this is more difficult to refute. Without doubt fewer chest physicians will be needed if tuberculosis becomes a rare disease. Much will still have to be done to keep it rare—B.C.G. vaccination, contact examinations, radiographic surveys, and the like. But when the number of patients being treated has fallen to a low level it may perhaps be expedient to return the prevention of tuberculosis to the direct control of the guardians of the public health. When this stage is reached—and of course it will be a gradual process—specialists in diseases of the chest must rest their case for continued existence on the contribution they are making to the study, diagnosis, treatment, and care of other chest diseases. If the specialty dies it will be the fault of its practitioners. Whether it is desirable that it should live is another matter; and we cannot discuss that without dealing with the general question of specialisation within the art of medicine.

We must wait and see. I think the chest specialist will establish his claim. But I may be wrong. Perhaps as waiting-lists disappear, sanatoria close, and medical superintendents compete for custom, the chest physicians, according to age, will prepare to play out time or acquire hobbies. They may, for instance, become specialist consultants in intrathoracic meningocele, endometrioma of the pleura, sarcoidosis in identical twins, or lung cancer in snuff-takers. They may collect sequestrated segments, peanuts in the bronchi, pulmonary paragonimiasis, or stamps with the Cross of Lorraine. But if they are on a part-time contract the hobby must pay; and that is more difficult. Possibly some fresh angle on chronic bronchitis would be a good bet. Anything new about this, the most common disorder in chest medicine, would be welcome; for we know little more about it than Hippocrates did.

It is a big subject. Why not come and talk about it? Come and see a chest clinic working; see my few remaining A.P.S and P.P.S and the children having B.C.G.; talk to my invaluable health visitor and care organiser; come with me to the patient's home; watch me "supervising" old patients and answering their questions about work, housing, marriage, and babies. I think you will see why I like the job; for this, of all the specialties, brings the physician closest to the patient.

Ring me up when you get a chance and we will fix a time.

Yours sincerely,

D. A. LONGLEA.

Parliament

Purchase-tax on Crash-helmets

IN the House of Lords on Nov. 10 Lord HAMPTON said the reduction of purchase-tax on crash-helmets from 25 to 10% was good so far as it went, but it did not go far enough. He would like to see it abolished. He was fortified in his view by a resolution passed at a British Medical Association meeting in June that these helmets should be free of tax. The importance of this form of protection was first emphasised by the late Sir Hugh Cairns, at Oxford, and it was largely as a result of his work that the wearing of these helmets in the Armed Forces was made compulsory. Lord AMULREE suggested that if the remaining small purchase-tax was abolished it should be done with some propaganda and a flourish. By that means he believed that more young people—and most of the deaths occurred among young people—would be encouraged to wear crash-helmets.

Lord HAWKE, Lord in Waiting, said that the campaign to wear these helmets was producing results. The Road Research Laboratory from a sample check reckoned that about 1 in 3 motor-cyclists now used them. Many people had not been deterred by the purchase-tax for 300,000 had bought helmets. The new Budget proposals reduced the tax to about a fifteenth of the retail price. The Government were in great difficulty because every time they were pressed to remove a particular item from purchase-tax one hundred other items were pressed, for equally good, if not better, reasons. He hoped that Lord Hampton and his friends would continue to urge motor-cyclists to wear a helmet, and that they would agree to cease arguing against the tax now that it had been so substantially reduced.

QUESTION TIME

N.H.S. Disciplinary Procedure

Mr. ALBERT ROBERTS asked the Minister of Health if he would investigate the operation of the National Health Service Act disciplinary procedure in relation to the services administered by the medical executive council, with a view to amending the composition of the appeal panel, in view of the fact that this panel comprised persons appointed by the Minister and that the further appeal from the panel was to the Minister himself.—Mr. IAIN MACLEOD replied: Under arrangements which go back in principle to 1913, and which appear to have worked satisfactorily in the interests of both patients and doctors, the responsibility for deciding appeals from the decisions of executive councils on complaints against practitioners taking part in the general medical services under

the National Health Service, rests with me and not with a panel. The persons taking oral hearings do so on my behalf.

Hospital Farms

Replying to a question, Mr. MACLEOD said that reports had been received from regional hospital boards on 207 hospital farms. Decisions had been reached on 112 of these and discussions were still taking place on the remainder. The decisions reached so far provided for the disposal of 14,574 acres of land. In 14 cases these decisions involve the complete abandonment of farming activities. 9 of the hospitals are mental hospitals, 4 tuberculosis hospitals, and 1 a general hospital.

Deaths from Lung Cancer and Coronary Thrombosis

Replying to a question, Mr. JAMES STUART, Secretary of State for Scotland, said that there were 1812 deaths from lung cancer in Scotland in 1954, and 1311 in the first three-quarters of 1955. During the first three-quarters of 1955 there were 6470 deaths from coronary thrombosis, and for the same period of 1954 the number was 6320.

Capital Punishment

Replying to a question, Major GWILYM LLOYD-GEORGE, Home Secretary, said that the Government had given further consideration to the report of the Royal Commission on capital punishment in the light of the debate on Feb. 10.[1] The commission's recommendations might be divided into three main groups.

The first consisted of the major recommendations that the age-limit below which the sentence of death might not be imposed should be raised from 18 to 21; that in all other cases the jury should be given discretion to decide whether there are such extenuating circumstances as to justify substituting the sentence of imprisonment for life for the sentence of death; and that the test of criminal responsibility laid down (so far as concerns England and Wales) by the McNaughten rules should be abrogated. The Government, after full consideration, did not feel able to accept any of these three recommendations.

The second group consisted of a number of other less important recommendations which could not be implemented without legislation. The Government did not see any prospect of legislation on this matter in the near future, and proposed to defer a decision on these recommendations until an opportunity for legislation could be found.

The third group consisted of recommendations to which effect could be given administratively. These had, in the main, been accepted and had been, or were being, put into effect. As regards England and Wales, he had, in particular, authorised the Prison Commissioners to proceed with the plans for a special institution for the detention and treatment of psychopaths and other prisoners who were mentally abnormal; and arrangements were now in force whereby persons charged with murder were seen by a psychiatrist from outside the prison service, as well as by a doctor or doctors from within that service, in any case where the prisoner's mental state was in doubt.

Except where otherwise stated, his remarks dealt with the position in England and Wales. Information about the administrative changes made in Scotland were given by the joint under-secretary of State for Scotland on Feb. 22.

Research into Rabies Control

Replying to questions, Mr. HEATHCOAT AMORY, Minister of Agriculture, said that the results of experiments in other countries over many years into the inoculation of dogs against rabies and of measures to control the disease were studied by the veterinary advisers of the Ministry. Practical experience had shown that, while inoculation could be a reasonably effective control in countries where the disease was endemic, it could by no means be relied upon to confer complete immunity. An expert committee set up by the World Health Organisation recently expressed the view that countries now free from rabies should continue to prohibit the import of dogs and cats or subject them to a long period of quarantine, preferably six months, at the port of entry. He was convinced, so far as this country was concerned, that to reduce the quarantine period or to rely on inoculation as an alternative would be an unjustifiable risk.

1. See *Lancet*, 1955, i, 410.

In England Now

A Running Commentary by Peripatetic Correspondents

A Conference of Conference Secretaries has lately been held in Harrogate. To what this conference directed its attention I am not sure. It may have been a planning conference designed to detect and attack the few backward segments of Western man's life that are not yet riddled with conferences. Or it may have been a practical conference in which the hard beds at Diddleall Spa and the dry Civic reception at Waterdown came in for crisp comment. Or again the conference may have addressed itself to some theoretical topic, such as keeping speakers to their allotted time.

Doubtless this conference was no less fruitful than any other. But was the choice of venue wise? Surely the burghers of Buxton and Bournemouth and Bath can hardly have heard with equanimity that the choice for this key conference had fallen on Harrogate. Might it not have been more diplomatic to hold the gathering in a town whose claims as a conference centre are less widely known—perhaps Barnsley or Brighouse or Bolton? The statesmanlike course would be to allot the task of choosing the place for the next Conference of Conference Secretaries to a Conference of Secretaries of Conference Secretaries; and I am unreliably informed that should the C.S.C.S. be held in Harrogate the delegates would be entertained by dancing in the streets of the town's Latin quarter.

There is really no end to this conference business. That at least is the hope in Harrogate—and Buxton and Bournemouth and Bath.

* * *

When my demob number came up some ten years ago I drove across to the nearby United States Air Force base to bid farewell to the mess. American hospitality can be infectious, so I shouted above the trumpeting of the juke box "If any of the Boys are down my way, just tell them to drop in." The major grinned. "Sure, sure, we'll do that, Doc." I turned my mind to ploughshares, while Elmer and Bud were swallowed up back in Texas. Colorful folk those types, but that was not the end of the story.

One night last week the Boys dropped in. They kept their promise in a big way—with a Superfortress in fact. My rustic brain-cells jolted back to the splutter of failing engines, the queer scrunch of tearing metal, and the old familiar whoosh of exploding petrol. Eleven parachutes floated down on to the fellside above the village, and soon the transatlantic gift of expression illuminated the darkness behind the farm, and we learned that all the crew were safe.

The Superfort lay tangled on the reservoir bank. A rivulet of fire had charred the belt of trees and saved the oil and petrol from mixing with our drinking-water. All seemed well once more, until the weekend brought the vultures. People came from far and wide to trample down the reservoir fences and hunt for souvenirs. Mobile cranes and enormous star-spangled wagons were soon hemmed in a long narrow lane by a fleet of native chariots, parked, abandoned, or broken down. The Brigantes opened the attack, swarming over the wreckage, tearing out equipment. The Occupying Powers sucked cans of tomato juice with helpless resignation, and had to be reinforced by the village bobby with his bicycle. Some bright spark wriggled round the blind side of the scrum and tore off a bag of fluorescein from an aircrew survival-suit. The instructions were plainly printed on the packet, so what could be more natural than to throw it into the reservoir?

As I have said before, our Allies are such a colorful people and they do everything in such a big way. Those packets were designed to dye the Atlantic green enough to be seen some eight miles away from ten thousand odd feet in the sky. The effect in our reservoir was impressive. The lurid currents swirled gaily through the filters and far out into the distribution mains before the man with the stop-tap could be found. Sunday morning found many repentant sinners fearing delirium tremens as they turned on the bathroom taps; the hypochondriacs were delighted with the flush. The

tide spread by Monday morning to the ends of the system; washing-day produced some pretty pastel shades in shirts. Alarm and despondency made the phone too hot to hold. But Time can do so much, and now we are adding the usual insipid stuff to our whisky (Bourbon). It has been so nice to meet the Boys again.

* * *

The best drug for getting rid of ants is chloroform; but it should be used with care. In my bathroom at Lahore some twenty years ago there was a minor plague of ants. They were black ants about half an inch long and as thick as a match-stick, and they went about their business by twos and threes without troubling anybody. There were soldier ants among them with formidable jaws. They troubled nobody either, but they looked as if they could be troublesome if they wanted to make difficulties and I decided to expel them. D.D.T. had not been invented, they enjoyed pyrethrum, so I got a couple of vials of condemned chloroform from the hospital and set about them with that. They issued from various small holes in the floor of the bathroom, so I took a hypodermic syringe and injected some chloroform down each hole. Then, feeling virtuous and scientific, I undressed and got into the bath, a tin bath, that stood in the middle of the floor.

For about half a minute nothing happened; then from every hole in the floor myriads of intoxicated ants poured out, thousands and thousands of them, wildly excited and racing confusedly all over the floor. Some of them climbed up the bath and ran demented races round the edge, and of these a few fell into the water. The delirious phase lasted for several minutes, then their motion grew slower and less agitated, they stumbled and waved their legs feebly, coma deepened, and in a few minutes the floor was covered with a carpet of dead ants, about half a stone of them by weight.

It was weeks before I saw another ant, or any crawling insect. But I would suggest to any other scientific investigator that there is no need to share the observation chamber with the subjects of the experiment. If he wishes to do so, the observer should be fully clad.

* * *

The calm surface of our village life has been ruffled by the question of rights of way and wrongs of way. The latter has been quickly, if surprisingly, settled; the question of rights of way will go on for ever.

The family of Farmer Brimcombe has lived in the parish for generations. The well that supplies the villagers with water is in one of his fields, and from time immemorial no difficulty has ever arisen. There has always been plenty of water, and the people have always been able to go and get it. But Farmer Brimcombe was the last of his line and when he died Farmer Muddiford bought the farm and the field with the well in it. At once he declared that he was not going to have people traipsing in his field after water, so he put his bull in it to drive them away. The village did not like that or him, and to show this they burned him in effigy on Guy Fawkes night. Farmer Muddiford was delighted, he felt that he had been made a public character, a man of real importance, a sort of historical figure, a Guy Fawkes, who would be remembered for ever. He took the bull out of the field and there has been no more trouble about the water. Very odd these unexpected reactions.

Farmer Cotleigh's farm lies down a long and stony lane, which makes rough going to reach the high road, but he claims a right of way over a neighbour's field, by which he can save fully two minutes. The question is has he this right of way? A committee was formed and a chairman appointed to decide. Several meetings were held and a representative of the county council attended twice. Neither Farmer Cotleigh nor his neighbour, who owns the field, put in an appearance; they "fear reprisals." So who can prove that Farmer Cotleigh has the right of way or has not? Nothing is settled, nothing ever will be settled, or can be settled. He may have the right, or he may not have the right, but it supplies the village with conversation, and in the local the argument sometimes waxes hot, and much beer is drunk. Right or wrong Farmer Cotleigh uses the short cut, and nobody stops him or ever will.

* * *

Bernard (biting on a fragment of pineapple): "You've been and put a bitamin in this pudding."

Letters to the Editor

POLIOMYELITIS IN SOUTH-EAST LONDON

SIR,—Concurrently with the epidemic of poliomyelitis in North-West London, to which Dr. Breen and Dr. McMath referred in their letters in your issue of Oct. 29, there has been an outbreak of the same disease of similar magnitude in South-East London. Between July 15 and Nov. 5 the Hither Green Hospital (formerly the Park Hospital) alone admitted 193 cases of poliomyelitis, of which 107 were paralytic and 86 non-paralytic.

The diagnosis of non-paralytic poliomyelitis was made only in the presence of the following evidence: (1) fever with clinical signs of meningitis, (2) an abnormal cerebro-spinal fluid showing 10 or more cells per c.mm., a moderate increase of protein, normal chlorides, normal sugar, no acid-fast bacilli, and no growth on culture, *in every instance*; (3) a rapid improvement in about one week without any specific therapy; (4) absence of lower-motor-neurone involvement and of all nervous sequelæ when discharged home three weeks later. In addition a large number of these patients came from the same district and sometimes from the same house or family where paralytic cases had occurred.

White-cell counts done in more than two-thirds of the cases showed nothing to suggest glandular fever. (Incidentally our admissions of genuine cases of glandular fever have not shown an increase above the average for this time of the year.) In the absence of better facilities for isolating the virus or determining an increase of antiviral bodies in the patient's serum, there can be little doubt that, on clinical grounds and on clinical associations alone, these cases of "virus meningitis" were indeed infections with the poliomyelitis virus.

Certain features of the epidemic are worth mentioning, though similar features have been observed before. The outbreak seems to have started in two adjacent London boroughs and to have spread peripherally from there in a few weeks like an oil-patch. During the first four weeks the paralytic and non-paralytic cases admitted were almost equal in numbers; after that the proportion of paralytic cases increased steadily and so did the severity of the paralysis. With the growth of the epidemic the virus appeared to increase in virulence.

Dr. Breen mentions the absence of polymorphs in the C.S.F. of many cases. This has not been our experience: on the contrary, a few cases showed a predominance of polymorphs, sometimes as high as 75%, giving the fluid a turbid appearance. They were all cases with spinal paralysis.

I find it difficult to understand how Dr. McMath establishes a diagnosis of non-paralytic poliomyelitis without an examination of the C.S.F. We have admitted during this epidemic quite a number of patients with short pyrexial attacks, sometimes with pharyngitis, sometimes with doubtful meningeal signs, who had been suspected of poliomyelitis but who showed a normal C.S.F. They have not been included in the above figures.

In conclusion, Sir, I wish to support strongly the plea of Dr. Breen and that of Dr. Lambert (Nov. 5) for increased facilities in the routine diagnosis of virus infections in connection with infectious-diseases hospitals. This applies not only for cases of "undifferentiated virus meningitis" but also for cases of virus infection of the lymph-nodes, the liver, the skin, and the respiratory tract.

Hither Green Hospital,
London, S.E.13. L. J. M. LAURENT.

INFECTION ACQUIRED IN HOSPITAL

SIR,—Dr. Needham (Nov. 12) raises an important point, and we agree with him that wool is an unsatisfactory material for hospital blankets, which are (or should be) washed frequently. As Dr. Needham says, woollen blankets, after repeated laundering, become matted and inefficient. Furthermore, the individual

fibres become brittle and easily break, forming fragments that are scattered and may convey infection whenever the bedding is disturbed.

Synthetic fibre ('Terylene') blankets stand up well to washing and sterilisation by boiling in the laundry. They are warm and comfortable in use, but objection has been made that they generate static electricity and are therefore dangerous in the operation theatre. In our view this is no disadvantage since, on bacteriological grounds alone, blankets should never be taken into the theatre. Moreover, it is not sufficiently appreciated that even wool has appreciable powers of generating static electricity.

There are also several kinds of woven cotton material suitable for use as hospital blankets. One of these is turkish towelling. They too may be sterilised by boiling.

We are now giving these different types of blanket ward trials, but it is yet too early for us to say how they stand up to long use, repeated sterilisation, and laundering.

ROBERT BLOWERS
Public Health Laboratory, General Hospital, Middlesbrough. J. POTTER
K. R. WALLACE.

SIR,—It is indeed encouraging to find appearing almost simultaneously, Dr. Leonard Colebrook's article of Oct. 29 and Dr. W. F. Wells's textbook.[1]

Dr. Colebrook adds another chapter to the large volume of evidence incriminating airborne organisms in infections of wounds and burns. Fortunately the picture need not be so black as he paints it, for there is also a large volume of published evidence showing that airborne bactericides could be a potent weapon for reducing cross-infections. It is somewhat surprising that Dr. Colebrook should have made only passing reference to American work on glycol aerosols and omitted all reference to British work on phenolic aerosols.

Apart from our own published work on air disinfection the Medical Research Council[2] recommended the trial of heat-volatilised hexylresorcinol. Dickson[3] and McGrath[4] offer good evidence of its efficiency in reducing morbidity from aerial infections, and we have had verbal reports of reduced contamination-rates in plasma and ampoule filling rooms of hospitals, blood-transfusion centres, and commercial premises.

McGrath's results in the Dublin Zoo monkey house are the most striking in that morbidity from upper-respiratory infections "almost disappeared, and there has been no case of tuberculosis" following the introduction of resorcinol and subsequently hexylresorcinol aerosols; and the position remains unchanged to date. These trials, extending now over six and a half years, seem to have passed unnoticed by the majority of English doctors. We suggest that the conditions in hospital practice are similar in many respects to those in McGrath's cases, and that hexylresorcinol aerosols would be equally effective.

Dr. MacKay, in his letter last week, mentions his work[5] on hexylresorcinol and reiterates that thermal aerosol generators are relatively cheap and simple compared with air-conditioning plant.[6] A high rate of kill (90–95% in five minutes) is a common finding in the laboratory. Removal of bacteria at such a rate by air changes would necessitate one air change every two minutes. This would cause great discomfort from draughts, and such rapid air movement might even increase the number of organisms reaching an operation wound or uncovered burn. It is open to question whether it would be in the best interest of patients to remain for long periods in bacteria-free air. The presence of dead or attenuated organisms such as occur in aerosol-treated atmospheres may have a prophylactic value.

Aerosols again come into the picture with regard to the control of flies. The continuous-flow aerosol has hitherto been installed in over 50 hospitals in this country, and has proved remarkably successful. It is particularly suitable for fly-control in wards, since it is silent, and needs no labour (and is therefore immune from the possibility of human failure, a major factor in pest-control); and as it dispenses only the pure insecticide the irritation which commonly results from carriers and solvents does not occur.

Finally Dr. Colebrook, in his otherwise admirable survey of the sources of contamination, omits an important one—the cockroach. While no species of cockroach has yet been implicated as a disease vector it is generally accepted that it may, at times, be an important agent in the mechanical transmission of infection on food. The eradication of these insects is extremely difficult, but the installation of continuous-flow-aerosol equipment has given excellent long-term results and has often eliminated cockroach populations of both *Blatta orientalis* and *Blattella germanica*. The same installations are also effective against flies.

Avebury Research Laboratories, Goring-on-Thames, Oxon. A. H. BAKER
F. G. SAREL WHITFIELD.

1. Wells, W. F. Airborne Contagion and Air Hygiene. Cambridge, Mass., 1955.
2. Studies in Air Hygiene. *Spec. Rep. Ser. med. Res. Coun., Lond.* 1948, no. 262; p. 314.
3. Dickson, C. *Irish J. med. Sci.* 1953, p. 337.
4. McGrath, J. *Ibid*, p. 343.
5. MacKay, I. *J. Hyg., Camb.* 1952, **50**, 82.
6. See also Baker, A. H. *Lancet*, 1954, i, 518.

THE CLIMATE OF DISCOVERY

SIR,—Einstein stated that the most important thing in scientific work is intuition. Is this where art comes into both Science and Medicine, and can the difference between Professor Arnott (Oct. 15) and Sir Francis Walshe (Oct. 29) be resolved in this way?

London, W.1. J. M. ALSTON.

PSYCHOSOMATIC PROBLEMS IN POSTURAL RE-EDUCATION

SIR,—I wonder if the profession, generally, realises the importance of Dr. Barlow's article of Sept. 24. If doctors could get patients to master the principles which he stresses, it would go a long way to minimise the effects of the strain of everyday life.

"Good posture" can be taught to the student or patient only by learning the fundamentals of muscle action, called the anatomy of movement. For any action to be carried out perfectly, the activating muscles must function just after the contraction of the synergists and both these sets of muscles must work on already alerted prime fixers.

There are three fundamental postures that the body can adopt—active, inactive, and passive.

We divide the human frame arbitrarily into eight mobile parts attached to eight fixed parts: (1) the head on the neck and trunk; (2) and (3) the shoulder girdle suspended by muscles from the skull, the cervical and dorsal spine, and the chest wall; (4) the trunk and pelvis; (5) and (6) the pelvis on the hip-joints; (7) and (8) the whole body on the ankles and feet.

In *active posture* all the mobile parts are firmly attached to the fixed levels by the prime fixing muscles. The position adopted is that of the ape, and is a position of alertness. If we consider it in detail, it is the position taken up in conditions of stress and strain. The matador and the trapeze artist both adopt this position and it is one in which the prime fixing muscles are in slight contraction but the other muscles are in balanced relaxation.

Scandinavian countries are now teaching relaxed posture. This stipulates that in the erect position the prime fixers are all fixed and the patient, as Dr. Barlow says, stands as tall as possible, so that he takes all the body-weight off his joints. The simile of the motor-car in which the tyres are pumped up, thus avoiding all strains on the rims of the wheels, chassis, and springs, is a good one.

Inactive posture is completely the opposite and means that the person slumps, so that the weight of the mobile parts acts as a chronic strain on the fixed parts, and the symptoms of postural strain are produced. If we consider the eight levels at which this can occur, we can see that many of the ills of the body can be accounted for by incorrect posture or sudden movements performed off guard; such symptoms may be headaches, pains in the neck, pains down the arms with brachial neuritis and capsulitis of the shoulders, low back pain with or without sciatica or pseudo-sciatica, pains in the buttock, and pains and aches in relation to flat feet.

Passive posture is one of complete relaxation when lying down or resting back in a chair. The full weight of the dependent parts of the body is taken by the bed or chair, but the body must be supported in a neutral position—that is to say, for example, the head should not be twisted to one side. It is important to adopt active posture before actually moving; otherwise, in moving from a passive to an active state, we fail to fix the prime fixers and we may do harm at one of these levels.

I agree with Dr. Barlow that the restoration of balanced equilibrium to the body requires not a strengthening of muscles but an integration of intention.

London, W.1. W. E. TUCKER.

THE HEAF TUBERCULIN TEST

SIR,—As the multiple-puncture tuberculin test is being used more extensively may I advise those using the apparatus that, in order to obtain clearly defined results, it is essential to use sharp needles. The points of the needles supplied are satisfactory for about 2500 tests, after which they should be sharpened. The old set of needles can be easily replaced by a new set which can be obtained from the manufacturers. The old ones may then be re-sharpened and will be ready to use again.

In carrying out the test, it is important that in addition to the needles being sharp they must all penetrate the skin to a uniform depth. It will be appreciated that any bruising due to blunt points or uneven penetration of the needles can make the reading of the tests difficult in persons with low tuberculin sensitivity, for a positive result depends on the presence of at least four points of palpable induration.

Welsh National School of Medicine, Cardiff. FREDERICK HEAF.

PREVENTION OF GOITRE

SIR,—It is not my purpose to enter into any lengthy discussion of your leading article of July 16. However, I wish to reply to your statement "But writers of old may simply not have mentioned goitre." Do you mean to imply that British physicians before the eighteenth century were less observant or less likely to record their observations than were their colleagues in France, Germany, and Italy? Moreover, as in Canada and New Zealand, European observers sometimes expressly stated that goitre was not present.

You neglected to mention that, in Scrimshaw's experiments, the goitres returned in a few weeks after iodine *medication* (5 mg. once a week per child) was stopped, although the salt in use contained as much iodine as you now recommend for use in Britain and four times as much as has been credited with marvellous results elsewhere.

In spite of the experiments of Axelrad, Leblond, and Isler, it still remains true that goitre has not been produced in animals upon a diet of purified food constituents and prevented by the addition of small quantities of iodine.

Finally, the prevalence of goitre began to diminish long before iodised salt was used. In Edmonton, Canada, it gradually decreased from 1820 or 1830 to its disappearance about 1870. It did not return for some forty years. In Switzerland, Piedmont, France, and the Argentine Republic, the decrease began about a century ago. In Switzerland, it was more marked among young men between 1905 and 1910 than in any similar period since the introduction of iodised salt. In the Argentine Republic, the diminution in the number of goitres had been so great that no separate enumeration was made in 1914, as there had been in 1869 and 1895.

Truly, if one gets to work with a pail when the tide is running out, one may convince oneself that one is lowering the level of the ocean.

New York University College of Medicine. ISIDOR GREENWALD.

MARGINAL-PUNCHED CARDS

SIR,—In view of the timely and helpful article by Dr. Maclean Smith (Oct. 29), some of your readers may be interested in the design of similar cards which have been in use in this unit during the past year for filing of literature references.

The size and punching specifications of the cards are as described by Dr. Maclean Smith. The numbering at the upper edge provides for coded representation of subject-matter, from 0000 to 9999—i.e., a total of ten thousand subjects, on a decimal system. Part of the lower edge is devoted to year of publication (indicated by its last two digits).

Separate alphabetical panels numbered 1, 2, and 3 allow filing according to first, second, and third letters respectively of the author's surname, the prefix Mac or Mc being considered as a single letter. To save space, the alphabetical panels, especially panel 2, have been compressed by allocating more than one letter to some of the holes. The design of these compressed panels was worked out in such a way as to cause minimal ambiguity, by studying the frequency distribution of the letters of the alphabet in a large random series of surnames.

Three holes at the right-hand margin specify (*a*) papers of which a reprint is held in the department, (*b*) general reviews of a major topic, and (*c*) papers consulted only by abstract. Three unlabelled holes on the lower edge may be used for other special classifications, according to individual preference. The upper left-hand corner is cut to aid alignment during filing.

The centre of the card contains spaces for title, up to four code references to subject-matter, author's name, source, and year of publication, with a large vacant panel for a summary of the paper (continued, if necessary, on the reverse of the card).

The advantages of this card for filing of references may be briefly stated:

(1) References may be readily extracted from the file according to subject, author, or year. Cards need not be filed in a particular order.

(2) The use of the decimal system, though requiring more space than the 1, 2, 4, 7 notation mentioned by Dr. Maclean Smith, enables cards to be extracted by fewer operations of the stilette.

(3) The design of the card allows more than one subject to be coded on the same card without confusion, and the names of two or more co-authors may be similarly recorded. Use of the first three letters of the surname rather than the initial letter only facilitates identification of the name.

The cards were supplied to my specification by Copeland-Chatterson Co. Ltd., 50, Wellington Street, Glasgow, C.2. I am grateful to my colleagues in the unit for encouragement in the designing of the cards. I should be pleased to send a specimen card to anyone interested, and I should welcome suggestions for their improvement.

Clinical Chemotherapeutic Research Unit, Western Infirmary, Glasgow, W.1. A. I. MACDOUGALL.

SIR,—I read Dr. Maclean Smith's article with considerable interest, having myself used marginal-punched cards for a considerable number of years. My method, however, differs fundamentally from his because the coding is based on the fact that any number can be expressed uniquely as the sum of the powers of 2.

Thus, $60 = 32 + 16 + 8 + 4$; hence by taking 3 groups of 5 holes, 60 would be coded as 0–5–123, according to the following numbering of the holes:

Group 1	*Group 2*	*Group 3*
1. 16384	1. 512	1. 16
2. 8192	2. 256	2. 8
3. 4096	3. 128	3. 4
4. 2048	4. 64	4. 2
5. 1024	5. 32	5. 1

In the same way cancer of the stomach, M.R.C. code 1210 $= 1024 + 128 + 32 + 16 + 8 + 2$, can be coded as 5–35–124. In this way 14 holes gives $2^{14}-1$ coding possibilities—i.e., 16383. This is more than adequate for the M.R.C. code.

The arithmetic has to be done only once, the result being suitably recorded. Practice with a few examples will show its simplicity. The international statistical classification of diseases can be similarly coded.

The card I use is punched to a special design on my own punching machine. It has 10 groups of 5 holes, a group of 5 holes having many advantages. It is easy to record a vast amount of information on this small card which would not be possible, so far as I am aware, by any other coding method. At the present time the card is used to code (*a*) the date, (*b*) the district of the patient's residence, (*c*) the presenting symptom, (*d*) his personal opinion of his illness (alarming or temporarily inconvenient) and whether I agreed or not, (*e*) the signs and symptoms, (*f*) the drug or mixture, (*g*) disease if diagnosed.

The system has been evolved to meet the ever-growing needs of a 40-year study of the minor ailments in a panel practice, which I feel I can now confidently describe as a "study of the science of morbidity." Some of the sequences of this science I have demonstrated graphically over many years.

Ever since 1919 I have employed a typist to record the medical histories, at first using shorthand, but for the last fifteen years by means of a 'Dictaphone.' The punched cards are the link between the sequences shown on the chart and the history sheets. I further feel justified in believing that in the future, by these means, clinical medicine will come to study social health and will seek to interpret the observations in terms of the human cell, thus bringing social medicine into line with all other branches of medical science.

With this in view, for the past seven or eight years, after discussing the matter with technicians of the Powers Samas Co., I have sacrificed some of the marginal punching so that the data on these cards can be immediately transferred to central punched cards at any time in the future. Search can then be effected through sorting machinery, and who can foretell what the speed of that search will be ?

It is a model of simplicity and can be easily worked by any general practitioner who has the necessary enthusiasm.

Halifax. A. GARVIE.

DEATHS AFTER ANÆSTHESIA

SIR,—I have read Dr. Lee's letter of Nov. 5 with the greatest interest, and I would like to congratulate him upon the establishment of a post-operation ward. As a corollary to this, the time has come to ensure that no major operation is carried out except under such ideal conditions.

London, W.1. B. WHITCHURCH HOWELL.

LYSERGIC ACID IN MENTAL DEFICIENCY

SIR,—Lysergic acid diethylamide (LSD25) was used as an adjunct in the psychotherapeutic treatment of chronic anxiety tension and obsessional neuroses by Sandison et al.[1] Their work led us to treat similarly a series of 16 mental defectives whose symptoms and history suggested that their failure of intellectual and social development may have been due, in no small part, to emotional factors operating during development.

The drug was given orally in doses of from 20 to 400 μg. in distilled water and was found to stimulate the memories of these patients, but the abreactive effects were limited and in spite of fairly prolonged periods of treatment—up to 26 treatments in three months—no lasting benefit has been observed.

In 7 instances the patients were more talkative and coöperative for a few days after the treatment but relapsed quite quickly. The majority experienced physical symptoms such as flushing of the face and limbs, tingling in the arms and legs, choking in the throat, and constriction of the chest.

The bizarre hallucinatory experiences recorded by others were noted in only 2 of our 16 cases and in these they were much simpler in character and may well have been the result of inadvertent suggestion on the part of the staff. It was observed that under LSD25, most of our patients were easily influenced by suggestion. This may be of therapeutic value rather than a disadvantage.

No instances of post-LSD depression occurred and only 2 patients were apprehensive or fearful during treatment. The majority looked forward to it, possibly because of the increased amount of attention which they received from the staff during this period.

Our impression is that while the effects of lysergic acid on mental defectives is to stimulate the memory, the general pattern of the resulting experiences is of a very simple order; but is of value as an aid in the psychotherapeutic approach to such cases.

Hensol Castle, Pontyclun, Glam. MARGARET E. B. DAVIES
T. S. DAVIES.

NEPHROSIS AND MALARIA

SIR,—Dr. Gairdner and Mr. Shute (Nov. 5) have performed a useful service in collecting available knowledge about malarial treatment of nephrosis in Britain.

Their observations on the pattern of events during induced nephrotic remissions are of great interest. A similar sequence may occur during the spontaneous evolution of nephrotic disease. Thus an adult with the clinical picture of nephrosis, with minimal azotæmia, had been followed for about one year, during which a slight rise of blood-pressure and blood-urea had taken place. For no obvious reason there was then a sudden marked diuresis, resulting in complete clearing of his œdema. Within a few days, the urine, which had consistently given Esbach readings of 8–12 g. per litre, became almost clear of protein. Unfortunately the diuresis was accompanied by rapid deterioration of renal function, death ensuing from uræmia within approximately one month.

Leicester Royal Infirmary. H. J. GOLDSMITH.

MONILIA ENDOCARDITIS

SIR,—The case reported by Dr. Caplan in your issue of Nov. 5 is probably the first to be proved in this country. Last year,[1] I described a case which may be of the same type; the patient had infective endocarditis and nephrectomy was performed for renal-artery infarction. Prof. A. C. P. Campbell kindly examined the removed kidney and found a fibrous granuloma occluding the main renal artery, and other smaller granulomata in the hilum, apparently on the course of the lobar branches of the renal artery. The histological nature of these was, he thought, quite incompatible with a *Streptococcus viridans* infection, and he found certain structures having the appearance of fungal colonies. He felt compelled to conclude that there had been a fungal endocarditis with embolism of the renal artery caused by an infected vegetation. As the patient recovered, full proof such as Dr. Caplan provides was not obtained.

Hove, Sussex. W. A. BOURNE.

TRANSILLUMINATION OF THE LARYNX

SIR,—Dr. Tate will not be surprised to learn that his observations (Nov. 5) on the value of transillumination when a laryngoscope light fails are confirmed by the experience of other anæsthetists.

Some twenty-three years ago in similar circumstances I was surprised to find the larynx dramatically transilluminated by the theatre skylight. Intubation was carried out with this aid alone. While this was admittedly not within the province of the anæsthetist, it did strike me forcibly at the time that transillumination might be of value in the diagnosis of some laryngeal diseases.

Following this first accidental experience of laryngeal transillumination by daylight, I have often demonstrated by means of torches and bedside lamps that external illumination can be a useful alternative method for the anæsthetist.

I cannot, however, agree that light failure is a common fault in modern laryngoscopes. Bulbs rarely fuse now-

1. Sandison, R. A., Spencer, A. M., Whitelaw, J. D. *J. ment. Sci.* 1954, **100**, 491. Sandison, R. A. *Ibid*, p. 508.

1. *Brit. med. J.* 1954, ii, 271.

adays; their construction is very much more robust than formerly, when a rheostat was essential for their protection. As regards electrical contacts, it is surely the business of the anæsthetist to see that, like the rest of his apparatus, the laryngoscope is functioning properly before he uses it.

London, W.1. I. W. MAGILL.

AN UNUSUAL EPIDEMIC

SIR,—I can now give further details of the epidemic which I described in your issue of Aug. 6.

Since then fifty further specimens of serum have been examined and found to be negative for antibodies against the A.P.C. group of viruses. It must now be concluded that this epidemic is not due to any of the known strains of the A.P.C.-virus group; but in view of certain similarities in the clinical picture to that caused by the A.P.C.-virus group, the possibility that the epidemic may be due to a hitherto unknown strain of this group cannot yet be excluded. Unfortunately attempted isolation of the presumptive virus in tissue-culture has had to be postponed owing to the great pressure of work on virus laboratories; so any identification is at present impossible.

It seems possible to me that cases similar to these in this epidemic may have occurred elsewhere, and it would be most interesting to hear whether this has been so. I should like to expand slightly the general account of features met in this epidemic—features not necessarily found in every case, for the symptoms have been protean. The main symptoms have been as follows:

1. Dull frontal headache, with retro-orbital pain.

2. General malaise, vertigo, and lack of energy and concentration. The vertigo, which is a constant feature, may be affected by posture and be severe at times. Incoördination is evident in some cases; there may, for instance, be difficulty in pouring tea into cups at the first attempt and breakage of crockery by normally sure-fingered people.

3. Eye symptoms. The eyes feel gritty and in most cases they water freely. Conjunctivitis (usually mild, and later phlyctenular) may appear at an early stage; sometimes it is unilateral. Photophobia occurs in the more severe cases at the onset, and diplopia has been complained of in some cases. Vision is usually affected to some extent; usually vision is described as blurred.

4. Upper-respiratory inflammation is common, and the patient may present with a harsh irritating tracheal type of cough. Sore throat is usually transient but may persist, causing dysphagia, or pain and discomfort in the mornings and evenings which ease off through the day.

5. Adenitis. This may be general or mainly restricted to the cervical chain. The glands are firm, rubbery to palpation, and tender.

6. The patient may present with abdominal symptoms—transient diarrhœa and vomiting, with flatulent distension and tenderness over the costal margin on each side. Some patients have severe epigastric pain and occasionally pain in the right iliac fossa, which is usually described as "colicky." Frequency of micturition with dysuria is an occasional symptom. The tongue is invariably heavily coated.

7. Myalgia, particularly affecting the paraspinal muscles, is common, as is a feeling of weakness and tiredness in the lower limbs. Night cramps are also usual, and some patients have remarked on a feeling of "deadness" at times in both upper and lower limbs, followed by "pins and needles." Reflexes in general are sluggish.

8. Skin rashes have occurred in some of those affected. These have been morbilliform and transient, lasting 36–48 hours, in children aged 3 weeks to 14 years and have been accompanied by a temperature of 99–100°F. A few other children and adults have had irritating raised lumps, with vesiculation, varying from a few to full body coverage and lasting several weeks before clearing. Several adults had a severe urticarial rash. An enanthem has been more usual, consisting of red maculopapules on the palate with creamy necrotic centres.

9. Many of the patients are sleepy by day and restless by night.

10. Recurrence of symptoms is common throughout convalescence. Recurrence may persist for several days, with headache, stiff neck, watering eyes, sore throat, and dizziness among other symptoms.

11. In different patients the temperature and pulse-rate vary from subnormal to 104°F and 130 per min. at the onset.

12. Weight loss is usual and may be considerable—e.g., 14 lb. over a period of several weeks in a child aged 6 years.

13. While the majority of patients recover after several weeks, in a not inconsiderable proportion symptoms persist with exacerbations over a period of months.

In conclusion I should like to thank Dr. B. E. Andrews, of the Central Public Health Laboratory, Colindale, for his kindness in examining sera from these cases, and Dr. D. G. Davies, director of the Public Health Laboratory, Carlisle, and Dr. K. J. Thomson, medical officer of health to the Border Rural District Council, for their continued interest and help.

Dalston, Cumberland. A. L. WALLIS.

THE EXCRETION OF RADIOACTIVE IODINE IN HUMAN MILK

SIR,—Last week's article by Dr. Miller and Dr. Weetch, confirming the concentration of radio-iodine in human milk,[1] gives a valuable warning, although it is fair to state that few tests of thyroid function now require a dose of ^{131}I as high as 25 μc.

In their last sentence—"Radioactive iodine should not be given to a nursing mother"—I believe from the context that the words "radioactive iodine" may have been used for "^{131}I." If a test has to be made in such circumstances, it is the outstanding advantage of ^{132}I that this short-lived isotope of iodine, used for a two-hour uptake test, can be given in rather smaller doses than ^{131}I, and causes less than 0·5% as much thyroid irradiation per microcurie as ^{131}I. Even if a nursing mother received an adequate test dose of 4 μc. of ^{132}I and did not interrupt feeding, the infant's thyroid, on the worst figures given by Miller and Weetch, would only receive 0·04 r.e.p. instead of the 50 r.e.p. from the 25 μc. dose of ^{131}I about which they are rightly anxious.

Department of Clinical Research,
University College Hospital Medical
School, London, W.C.1. E. ERIC POCHIN.

ARGENTAFFIN CARCINOMA

SIR,—In their description last week of a case of argentaffin carcinoma, Dr. Goble and his colleagues refer to the improvement in symptoms and the fall in serum 5-hydroxytryptamine (5-H.T.) and daily urinary 5-H.T. excretion after treatment with ^{193}Au, and make the interesting suggestion that these changes would be explained by the inactivation of a naturally occurring mono-amine oxidase inhibitor. Another possibility deserves to be considered.

Dr. Goble and his collaborators observed a severe temporary granulocytopenia but make no mention of changes in the platelet-count; after a large dose of radioactive gold this might well have fallen also. With much free 5-H.T. in the plasma the platelets would be already saturated and a fall in their number would lead to a fall in serum 5-H.T. which might account for all or part of that observed. What effect a fall in blood 5-H.T. occasioned in this way might have on symptoms and 5-H.T. excretion, cannot at present be said. It would be interesting to know whether thrombocytopenia in fact occurred.

Finally, may I point out that the striking difference observed in the 5-H.T. content of serum derived from blood from the right and left sides of the heart accords with the observation by Gaddum et al.[2] that the perfused cat lung removes free 5-H.T. from the perfusing blood.

Department of Therapeutics,
St. Thomas's Hospital,
London, S.E.1. R. S. STACEY.

1. Honour, A. J., Myant, N. B., Rowlands, E. N. *Clin. Sci.* 1952, 11, 447.
2. Gaddum, J. H., Hebb, C. O., Silver, A., Swan, A. A. B. *Quart. J. exp. Physiol.* 1953, 38, 255.

Obituary

ARTHUR RALPH THOMPSON

Ch.M. Vict., F.R.C.S.

Mr. A. R. Thompson was consulting surgeon emeritus to the genito-urinary department of Guy's Hospital. He came to London in 1898 from the Leeds medical school, and took the M.B. of the Victoria University in 1901. As a student he played rugger for Guy's and also for the Barbarians. While holding house-appointments at Guy's, he took the F.R.C.S. in 1902. Later he became surgical registrar, and he was the first to hold the post of resident surgical officer. Returning to Leeds he was assistant surgeon to the Victoria Hospital for Children till in 1910 he was appointed surgeon in charge of the genito-urinary department at Guy's. He retired in 1936.

Sir Heneage Ogilvie writes: "A. R. Thompson was the most remarkable and possibly the best-loved figure of his time at Guy's Hospital. There are few men in any group who are known to all their contemporaries and fewer still who are remembered by succeeding generations even after the lapse of years. 'Rudy' Thompson is remembered, remembered vividly, and remembered with affection by all who worked at Guy's during the first fifty years of the present century.

"The nickname 'Rudy' was given to Thompson as a student, and it stuck. No other epithet could so aptly describe him; it was congruous yet not uncomplimentary. He was rude in the Elizabethan and Masonic sense of rugged, fierce, tumultuous, in the sense that Othello used it of himself—'Rude am I in my speech, and little blessed with the soft phrase of peace.'

"Thompson was chosen by Sir Cooper Perry, a great superintendent and one of the finest judges of men who ever lived, to found a department of urology of Guy's. Perry took the line that a vacancy on the staff of a teaching hospital should be filled by the best man available, whatever his previous training, rather than by him who had the greatest claim on grounds of sympathy or long service. He seldom made a mistake. He chose Mollison for otolaryngology and he chose Trethowan for orthopædics. Ralph Thompson was chosen because he was the ablest man of his generation. That he did not succeed in the way Perry had hoped was not due to lack of brains or of skill, but rather of the wiles of the market-place. Cooper Perry's successor, Sir Herbert Eason, once remarked to a friend that the trouble with Thompson was that, as a young man, he devoured Boswell's *Life of Johnson*, and tried thereafter to model himself on the great doctor. Certainly in his direct and fearless approach to any man, problem, or situation, in his slow careful speech and his somewhat archaic and grandiloquent phraseology, in his outspoken comments and sudden bursts of anger, in his retorts discourteous, even in his carelessness about dress and personal appearance, he was Dr. Johnson come to life in the 20th century. Alas, the century was wrong for such a character.

"Thompson had ability above the average. He was at heart an anatomist, with profound knowledge and an original outlook. When, as an orthopædic surgeon, I was given the task of opening a discussion on injuries of the elbow-joint, I had first to ask myself: 'What is the elbow-joint?' I found the answer, clear and stimulating, in one of his articles (*J. Anat.* 1924, **58**, 368). His last communication was a paper on Homer as an Anatomist, read to the historical section of the Royal Society of Medicine.

"As a urologist his work was original and stimulating. Though he never developed a large private practice, he devotedly served the department he had founded, and handed it on in first-class condition to his successor.

"He was regarded with universal affection, and particularly by his house-surgeons and dressers, men stout enough of heart to face the shocks and alarms which they knew they would encounter for the privilege of working with a man of more than life size, of living in the company of one whose comments on the passing scene were always enlightening, of being able in the evening to recount to their fellows incidents straight from the centre of combustion.

"I may have dwelt overmuch on the uncouth side of Thompson's character and externals; yet an attempt to soften the character and gloss the externals would give a false impression of a man, who stood out among his contemporaries like a block of granite. He was rude, but he was seldom discourteous, and never slanderous. He was critical, but always open in his criticisms. He fought, but he never hated. He was straight, he was loyal, and he had an unflinching sense of duty. With women he was courtly and gentle. He wrote some charming verse. He quarrelled openly, violently, and joyously, but he harboured no resentment and he never made a lasting enemy. On the contrary, he had countless friends in every walk of life, men who sought his company for the warm shy nature and the kindly philosophy that he showed to those whose companionship he valued."

Mr. Thompson died at Guy's Hospital on Oct. 16 at the age of 79. His widow survives him with two sons and two daughters.

WILLIAM MACKENZIE

M.A., M.D., B.Sc. Edin., F.R.C.S.E., D.P.H.

Dr. William Mackenzie began his work as a doctor in Gosforth in 1907 after several postgraduate years in Edinburgh, during which he had taken the double qualification of F.R.C.S.E. in 1905 and M.D. in 1906. It was soon apparent that he was a man of exceptional ability, for within four years he had established a busy private practice and had been appointed medical officer to the Gosforth Home for Crippled Children and assistant surgeon to the Fleming Memorial Hospital for Sick Children in Newcastle. He soon found the load of work too much for his studious temperament, and it is significant that, though he resigned from The Fleming in 1914, his first annual report to the committee of the cripples' home contained a plea for orthopædic treatment for some of the children there. This idea was not immediately accepted, but such opposition as there was only stimulated him to further efforts. His tenacity of purpose grew and eventually led him to devote his life to the orthopædic problems of crippled children in the North of England.

Three influences guided his preparation for this task. The first was his election to the Newcastle Pathological Club in 1913, for it fostered the independence of his mind and gave him the intellectual stimulus and companionship which he enjoyed. The second influence came from the late Prof. Rutherford Morison, with whom he worked at the Northumberland War Hospital in 1915–16. Morison was intensely interested in the proposal to start orthopædic treatment at the cripples' home, and he persuaded Mr. Sanderson, its founder and first chairman, to accept the idea and agreed to be the consulting surgeon. A visit from Sir Robert Jones, in 1917, was the third important influence in Mackenzie's life. Robert Jones not only convinced the committee at Gosforth that orthopædic treatment was necessary, but offered to arrange a transfer for Mackenzie, who happened to be home on sick-leave from service in France, to Alder Hey Military Orthopædic Hospital, Liverpool, where he could gain practical experience in orthopædics.

After the war Sanderson asked Mackenzie to prepare a scheme for a hospital block, which was opened by Robert Jones in 1924. Such was the enthusiasm of Morison and Mackenzie that in 1920, as a temporary measure, a ward with operating suite and X-ray plant was taken over at the Home for Incurables at Spittal Tongues, and there their first orthopædic operations were done. Morison's monthly visits continued for many years. Cases were reviewed, treatments were planned, and a list of operations was done under his eagle-eye. These were great occasions for Mackenzie, and set the stamp of excellence on his work.

His next objective was to set up orthopædic clinics in Newcastle and in Northumberland which would be linked with the work at Gosforth. This presented administrative difficulties, but these were overcome by personal appointments. In 1923 the Newcastle Education Committee set up orthopædic clinics in different parts of the city and Mackenzie was appointed orthopædic surgeon in attendance at these clinics. In furtherance of a county scheme Dame Agnes Hunt visited Newcastle in 1926, and as a direct result the late Miss Ella Pease raised funds and, along with Mackenzie, started an orthopædic clinic at Alnwick. In 1928 the Northumberland County Council followed suit and Mackenzie became the

county orthopædic surgeon for their clinics. He thus became the lynch-pin in a comprehensive orthopædic organisation for children; but it was ten years before the interlocking nature of his appointments was recognised. When the late war broke out he was about to be offered a full-time post.

In 1930 the name of the Gosforth cripples' home was changed to the W. J. Sanderson Orthopædic Hospital School, and Mackenzie became medical superintendent and orthopædic surgeon. He soon had little time for private practice, for the care of a hundred children was a great responsibility, but he wisely invoked the help of colleagues in medicine and in surgery, and, with them and the medical officers of the local authorities, formed a medical advisory committee for the hospital, which he served as secretary.

Though he was a keen and studious observer Mackenzie never rushed into print. With Rutherford Morison he published an article in 1926 on the treatment of dangle foot, and in 1947 the *Journal of Bone and Joint Surgery* published his much-quoted paper on sclerosis of the long bones, a condition better known as osteoid osteoma. Rare diseases fascinated him and his studies of melorheostosis and of hyperplastic callus formation in fragilitas osseum are often quoted.

The material of an extensive investigation into flat foot is still unpublished, for with the coming of the second world war The Sanderson was taken over as an E.M.S. hospital, the children were evacuated to Meldon Park, near Morpeth, and there was no time for writing. Fortunately, Mackenzie survived the strain of these strenuous years and was able to re-establish the work of the orthopædic hospital school at Gosforth when the war ended. His retirement under the age-limit was precipitated by the coming of the National Health Service, but his pioneering work was well done and he left behind him a comprehensive orthopædic organisation for school children which compared well with any in the country.

J. G., to whom we owe this memoir, writes: "Dr. Mackenzie's later years were chequered by ill health but he retained a living interest in the developments of modern medicine and surgery and in literature. It was always stimulating to meet him, for his conversation was thoughtful and instructive and tinged with a shy humour. He never sought the limelight; indeed he was modest and often diffident; but where his ideals were concerned he never gave in."

He died on Oct. 25 at the age of 77, and he leaves a widow and two daughters.

EDITH MARGARET TAYLOR

M.B. Lond., F.F.A. R.C.S.

Dr. Margaret Taylor, anæsthetist to the Elizabeth Garrett Anderson Hospital and to other London hospitals, died on Nov. 2.

The daughter of Mr. Dennis Ross-Johnson of Bristol, she was educated at Oswestry High School, the Francis Holland School, London, and Newnham College, Cambridge. As a student she did not allow her popularity to deflect her from her work, and she took both parts of the natural sciences tripos. From Cambridge she went in 1919 to the physiology laboratories at the London School of Medicine for Women where she held a demonstratorship in Prof. Winifred Cullis's department. After three years she went on to complete her medical training at University College, and in 1925 she graduated M.B.

For a year after qualification she held the post of assistant resident medical officer at St. Mary's Hospital for Women and Children, Plaistow, and then she returned to University College as anæsthetics registrar. In due course she was appointed to the staffs of the Metropolitan Throat Hospital, the South London Hospital for Women, and the National Hospital, Queen Square. But her main work and her chief interest lay in the Elizabeth Garrett Anderson Hospital. Her skill as an anæsthetist, based on her unusually wide knowledge of physiology, was appreciated by her surgical colleagues. She also took a constructive part in the work of the house-committee, and many of the recent improvements in the operating-theatres were the result of her enterprise and forethought.

H. E. D. writes: "Many past students of University College Hospital will experience a feeling of acute loss at the death of Margaret Taylor. Despite her own busy professional and private life, she seemed always able to receive one with a kind and gracious welcome in surroundings of great æsthetic pleasure at her and Julian Taylor's home. The radiance of her colouring and elegance of dress captivated all at once. Later the appreciation of her thoughtfulness for others and generosity of spirit aroused a deep affection in those who knew her well. She was widely read, and had many interests outside her work. French cooking, the culture of rare bulbs and flowering shrubs, riding, and sailing were but a few of these. Every meeting with her had a quality of joy enhanced by contact with her keen mind and shrewd judgment. Among her friends and colleagues, the memory of her rare gifts of spiritual and physical grace will long remain."

She married in 1926 Mr. Julian Taylor, and there are two sons of the marriage.

MURIEL HELEN DEEM

O.B.E., M.D. N.Z.

Mrs. Helen Deem, who died on Oct. 26, was a daughter of the late Sir Thomas Easterfield, a former director of the Cawthron Institute, Nelson, New Zealand. She qualified at Otago in 1924, and four years later proceeded M.D. N.Z., a degree held by few women. She was the first to gain the Lady King scholarship founded in memory of the wife of Sir Truby King. Dr. Deem's husband was the city engineer of Wanganui, and on his early death she came to England for further study, and took the D.OBST. On her return to New Zealand she entered the health service, and was soon appointed medical adviser to the Royal New Zealand Society for the Health of Women and Children. This body, less formally known as "the Plunket Society," was founded by Sir Truby King and it promulgated his strict rules for infant-feeding. He was extremely conservative and would allow no modification of these rules, nor would his committee. It was widely held, however, that this admirable society was not, in this particular, moving with the times, and a few years after King's death it fell to Dr. Deem to bring it up to date, a task which required great tact. Her revision of the society's infant-feeding formulæ was a notable example of transition and progress, and it was later accepted by the New Zealand Pædiatric Society as a reasonable basis for infant-feeding throughout the country. The widely used height and weight tables for New Zealand infants are also a product of her quest for basic knowledge. Other important work she undertook included the care of premature babies, studies of their later progress, and periodical surveys of breast-feeding. She arranged for greater use to be made of the clinical resources of the Plunket Society in teaching. She also organised a campaign against preventable accidents to children, and was lecturer in preventive pædiatrics at the Otago Medical School. She was appointed O.B.E. in 1952.

M. McG. writes: "Dr. Deem's absorbing interest was the welfare of the infant and young child, and whatever problem she undertook was pursued with vigour and enthusiasm, tempered with sound judgment and meticulous attention to detail. She possessed in addition the happy faculty of being able to instil into those associated with her something of her own interest and enthusiasm, and thus stimulated a team spirit which was bound to produce results. Although her work as medical adviser to the Plunket Society was largely administrative, she maintained an active interest in clinical pædiatrics, and her opinion on nutritional, developmental, and other problems of infancy was often sought by the Government and official bodies. Her life has been a full and active one, and nothing could match her courage and determination in completing as much of her work as possible during the few short months which she knew were left to her. Much has been accomplished—she has pointed the way for further efforts in the future."

Births, Marriages, and Deaths

DEATHS

STEELE.—On Nov. 6 at Penrhyn Lodge, Gloucester Gate, N.W.1, Anne, widow of Russell Steele, M.D., of Hemel Hempstead, in her 93rd year.

Notes and News

DOMICILIARY VISITS BY WHOLE-TIME SPECIALISTS

THE Minister of Health has approved [1] a Whitley Council agreement [2] that, subject to certain limitations, whole-time consultants, and in certain circumstances [3] senior hospital medical officers, should be paid for domiciliary consultations. A definition of the term "domiciliary consultation" has also been agreed to and will be inserted in the Terms and Conditions of Service.

A domiciliary consultation is defined as "a visit to the patient's home, at the request of the general practitioner and normally in his company, to advise on the diagnosis or treatment of a patient who on medical grounds cannot attend hospital." Visits *not* falling within this definition include (i) a visit made at the instance of a hospital or specialist to review the urgency of a proposed admission or to continue or supervise treatment initiated or prescribed at a hospital or clinic; (ii) a visit made by a chest physician to a patient on the tuberculosis register of any chest clinic; and (iii) a visit undertaken as part of work done for a local health authority. Another limitation is that whole-time specialists will not be paid for the first eight domiciliary visits they make in any quarter. The fee for part-timers and (subject to this condition) whole-timers will be unchanged at 4 guineas, with an additional 2 guineas where any operative procedure other than obstetric is undertaken or where the doctor uses his own electrocardiograph or portable X-ray apparatus, and an additional 4 guineas for any obstetric operation. These extra fees will, as hitherto, be payable only once in respect of each patient for the current illness. When a specialist sees more than one patient in the same residence or institution during the same visit the consultation fee will be 2 guineas for each case after the first, and the maximum will be 10 guineas, however many cases he sees.

Part-timers only will continue to receive payments, additional to these fees and to the normal travelling and subsistence expenses, of 1 guinea for a journey to a place more than 20 and less than 40 road miles away, 2 guineas for 40–60 miles, and so on, with an extra guinea for every 20 miles.

The maximum remuneration for domiciliary visits (excluding travelling and subsistence allowances, additional mileage payment, and fees for the use of the doctor's own apparatus) remains the same—namely, 200 guineas in any quarter or 800 guineas in any year, whichever the specialist prefers.

STUDY, EXPERIMENT, AND DEMONSTRATION

THESE three incisive words sum up the Nuffield Provincial Hospitals Trust's way of tackling a problem, and their third report,[4] which covers the years 1951 to 1955, describes how many of their more senior projects have now reached the third stage. The trustees have taken advantage of this moment of quinquennial stocktaking to thank Mr. L. J. Farrer-Brown, secretary of the Trust (and director of the Nuffield Foundation itself), for his share in their work. In recognition of his contribution they have appointed him a governing trustee and he has accordingly resigned the secretaryship.

Many of the important studies sponsored by the Trust, and the practical experiments which have been based on them, have already been described in our columns. Drawn together in this report they make a striking record of courageous ventures based on careful and conscientious appraisal. Thus the new hospital to be built at Alderney will benefit both from the Trust's investigation into the function and design of hospitals, and from the experimental ward blocks built at Larkfield Hospital, Greenock, and at Musgrave Park Hospital, Belfast. The two-year nurse-training scheme which is being carried out at Edinburgh in partnership with the Department of Health for Scotland has been influenced by the Trust's job-analysis of the work of nurses. To the Trust's interest in the services outside the hospitals we owe Dr. Stephen Taylor's survey of general practice, and, in bricks and mortar, three experimental variations on the idea of health centres—the diagnostic centre at Corby, the teaching health centre at the University of Manchester, and the three health centres at Harlow New Town. In all these projects the Trust's success in persuading local and specialist organisations to share in the responsibility promises well for their future usefulness and expansion.

The Trust have not only drawn on outside help in their own schemes; they have also been ready to support the work of others who share their interests. In 1952 they gave a grant to help the Acton Society Trust to study the organisation and administration of our hospital service. This work, which has now been completed, is to be published as a series of pamphlets. The first, *Background and Blueprint*, which appeared earlier this month,[5] is (as its title suggests) an introductory study. Each of the other pamphlets will deal with a specific problem of the hospitals. The second, for instance, will consider the impact on the hospitals of the changes in organisation which the National Health Service has brought, and others will discuss the administrative relationship of the hospitals with the Ministry, and their professional relationship with doctors and with nurses.

A NEW BLOOD-TRANSFUSION CENTRE

THE new North East Metropolitan Regional Blood-Transfusion Centre at Brentwood, Essex, which was to be opened by the Minister of Health on Nov. 17, is the second in the country designed specifically for its purpose. Moreover, it is the first blood-transfusion centre in Britain to start operating almost overnight; and Dr. W. J. Jenkins, the medical director, encountered some problems for which there were no precedents. The chief of these was starting a speedy, safe service with a staff largely inexperienced and unused to the building and its equipment.

The building, made of pre-stressed concrete and capable of expansion, is designed round a central hall which gives easy access to the blood-transfusion vehicles: two are fitted with refrigerators. From this hall the used equipment passes though the washing-room and the sterilising plant, and, when ready for use again, to a store-room adjacent to the hall. A cold room leads off the hall, and stores blood at 4°C, and there is also a "deep-freeze" room for storing sera at −20°C. The upper floor consists of spacious and well-appointed laboratories for routine blood-grouping, special tests, bacteriological investigations, and research. The centre has its own steam-supply and water-softening plant.

Dr. Jenkins has a staff of 50, including a chief technician, a sister-in-charge, and junior technicians. There are two teams for collecting blood, headed by doctors with the status of junior hospital medical officer, and these cover half the North East Metropolitan Region, collecting an average of 700–800 pints of blood weekly. Half the hospitals in the region are at present supplied with blood by the centre. Dr. Jenkins hopes soon to cover the whole region, but this will need an increase of staff to at least 120, and the formation of more teams.

SCHIZOPHRENIC ART

AN exhibition called Aspects of Schizophrenic Art is now open at the Institute of Contemporary Arts, 17, Dover Street, London, W.1. Every drawing or painting is the work of a patient who was suffering from schizophrenia at the time it was executed. Naturally, the identity of the artists is withheld—with the exception of Nijinski, whose contribution is dated during the height of his illness in 1920. Other exhibits come from mental hospitals in England, Scotland, and France. Many are by patients who have died or recovered and left hospital; a few are by patients still in hospital who have agreed to contribute. The aim of the exhibition is "to demonstrate some of the ways in which this strange malady affects the capacity for self-expression in art of those who are its victims, and in so doing to contribute (it is hoped) towards a clearer and more sympathetic understanding of their plight."

There are examples of the dramatic and rapid changes in style and content of individual artists' work; and the largest section of the exhibition shows examples of schizophrenic imagery, which is sometimes dramatic, bizarre, and moving. These are the qualities which the surrealists envied—the direct access to unconscious fantasy. In all these works there is an attempt to convey something of the uncanny state of strangeness in which the schizophrenic suffers. Often, painting or drawing is not enough: words and phrases invade the pictures—and these may be new words coined to express something different from ordinary experience. When the patient's normal personality is submerged by the disease,

1. Memorandum H.M.(55)107.
2. M.D.B. circular no. 27.
3. See R.H.B.(51)11/B.G.(51)11, para. 4.
4. Third Report 1951–55. Nuffield Provincial Hospitals Trust, Nuffield Lodge, Regent's Park, London, N.W.1. 1955. Pp. 60.
5. Background and Blueprint. Acton Society Trust, 39, Welbeck Street, London, W.1. 1955. Pp. 45. 4*s*.

certain repetitive patterns seem to impose themselves upon his forms of expression. These are illustrated in the section devoted to "schizophrenic stylisation."

The emphasis throughout the exhibition, which is open until Dec. 3, is not upon the bizarre and the incoherent, but upon the richness of imaginative experience which appears to be one accompaniment of this terrible disease.

THE HORSE SHOE CLUB

LAST Saturday, at Apothecaries' Hall in London, this club held its autumn cocktail party (one of two held every year) to entertain doctors from the United States and Canada who are working here, for the time being, either in their country's Armed Forces or in civilian posts; and also their wives. The hosts included Dr. Geoffrey Bourne of St. Bartholomew's Hospital, chairman of the club, Sir Harry Hague, the treasurer, and Dr. Claude Nicol, the secretary. Some 150 people attended, and as many as could do so added to their enjoyment of the surroundings by hearing Dr. Neville Finzi, the master, discourse on some of the treasures of the Worshipful Society of Apothecaries.

The objects of the club are to:

(*a*) Foster friendship between American, Canadian, and English men and women interested in the cure and prevention of disease. (*b*) Encourage exchange research and clinical appointments between these countries. (*c*) Provide hospitality for overseas visitors.

University of London

Dr. S. W. Hinds, lecturer in child health and social medicine in the University of Bristol, has been appointed to the university readership in public health at the London School of Hygiene and Tropical Medicine.

The title of professor of biology in the university has been conferred on Mr. G. E. H. Foxon, M.SC., in respect of his post at Guy's Hospital Medical School.

University of Birmingham

The following appointments have been made: Dr. W. P. Dallas Ross, lecturer in anatomy; Mr. T. S. Donovan, part-time lecturer in orthopædic surgery; Dr. V. H. Springett, part-time lecturer in tuberculosis; Mr. R. R. S. Strang and Mr. E. C. N. Strong, part-time lecturers in diseases of the ear, nose, and throat.

University of Liverpool

On Nov. 30 the honorary degree of doctor of laws will be conferred on Dr. T. B. Davie, principal and vice-chancellor of the University of Cape Town and formerly George Holt professor of pathology and dean of the faculty of medicine in the University of Liverpool.

Royal College of Surgeons of England

Sir Henry Dale, O.M., F.R.S., chairman of the Wellcome Trustees, will open the Wellcome Museums at the college, Lincoln's Inn Fields, W.C.2, on Wednesday, Nov. 23, at 3 P.M.

At a meeting of the council on Nov. 10, Sir Harry Platt, the president, in the chair, reported that he had presented a diploma of honorary fellowship to Dr. Fred Coller, of Michigan, during his recent visit to the United States of America. An honorary fellowship was also awarded to Sir John Stopford, vice-chancellor of the University of Manchester, whose diploma will be presented at the annual meeting of fellows and members to be held in Manchester on Dec. 10. Mr. R. P. Scott Mason, vice-president, was appointed Bradshaw Lecturer for 1956. Mr. A. Dickson Wright, Mr. F. C. W. Capps, and Mr. R. C. Davenport were re-elected, and Mr. E. C. B. Butler and Mr. S. H. Wass were elected members of the court of examiners for three years from Dec. 8, 1955.

The Nuffield prize in the faculty of anæsthetists was awarded to Dr. Maurice J. W. Sando (Adelaide), and Begley prizes to Rosemary R. Ashby and A. R. Tanser.

Diplomas of membership and postgraduate diplomas in medical radiotherapy, and laryngology and otology, were granted to the candidates named in our report of the comitia of the Royal College of Physicians (*Lancet*, Nov. 5, 1955, p. 986). A diploma of child health was also granted to Dr. Katherine M. Cadbury.

Royal College of Physicians of Ireland

At a meeting on Nov. 4, with Dr. F. J. O'Donnell, the president, in the chair, the following doctors were admitted as licentiates and members:

Margery N. Cummins, Bridget V. Foley, E. S. Mitchell.

Royal College of Physicians of London

On Tuesday and Thursday, Dec. 6 and 8, Dr. Charles Newman will deliver the FitzPatrick lectures. His subject will be the Evolution of Medical Education in the 19th Century. The Tudor Edwards lecture will be given on Thursday, Dec. 15, by Sir Geoffrey Marshall, who will speak on Tudor Edwards's contribution to the study of diseases of the chest. The lectures will be held at the college, Pall Mall East, S.W.1, and will begin at 5 P.M.

Royal Faculty of Physicians and Surgeons of Glasgow

On Nov. 7, the following were elected office-bearers for the coming year:

President, Prof. Stanley Graham; visitor, Prof. Stanley Alstead; hon. secretary, Dr. A. H. Imrie; hon. treasurer, Dr. J. A. W. McCluskie; hon. librarian, Dr. A. L. Goodall; representative on the General Medical Council, Dr. Andrew Allison; councillors, Prof. D. F. Cappell, Dr. D. McKay Hart, Mr. Arthur Jacobs, Dr. Samuel Lazarus, Dr. W. Ferguson Mackenzie, Prof. W. Arthur Mackey, Dr. Hector R. MacLennan, Mr. D. C. Milne, Dr. Gavin B. Shaw.

Royal Society

A Royal medal of the society has been awarded to Prof. V. B. Wigglesworth, F.R.S., for his experimental contributions to insect physiology.

Medical Research Council

The Minister of Labour and National Service has been appointed a member of the Medical Research Committee of the Privy Council. This is the committee under which the Medical Research Council operates.

Symposium on Stammering

This symposium will be given at the Goldsmiths' College, London, S.E.14, on Monday, Dec. 12, at 6.45 P.M., by students of Mr. H. V. Hemery's speech re-education classes.

Royal Society of Medicine

On Wednesday, Nov. 30, at 8.30 P.M., Lord Radcliffe will deliver the Lloyd Roberts lecture to this society at 1, Wimpole Street, London, W.1. The title of his address will be How a Lawyer Thinks.

British Diabetic Association

An award of £1000 is offered to a person or persons finding a cure or control for Kimmelstiel-Wilson lesion. Further information may be had from the association, 152, Harley Street, London, W.1.

Postgraduate Travelling Fellowships

The governing body of the British Postgraduate Medical Federation invites applications for these fellowships from doctors or dentists who are training as specialists and wish to obtain experience of the methods of practice, education, and research at universities or other centres in the United Kingdom and abroad. The annual value of the fellowships is not less than £750 with additional allowances. Further particulars can be found in our advertisement columns.

Society of Medical Officers of Health

There have been suggestions that this society, now entering its 100th year, should adopt a new name to indicate the broader scope of its affairs; but it has been decided to retain the present one at least until the centenary celebrations are over. At the annual dinner on Nov. 10, Dr. Charles F. White, the president, said that after that they must again consider finding a new name to embrace all those concerned in preventive medicine. Dr. White was replying to the toast of The Society proposed by the Minister of Health, Mr. Iain Macleod. Now that some of the more immediate difficulties facing the National Health Service in 1948 had been tackled, the Minister hoped to see increasing emphasis on preventive medicine and, in particular, closer links between general practitioners and medical officers of health. The Guests were welcomed in a cordial speech by Prof. R. H. Parry, president of the society in 1948. In his reply, Sir Russell Brain, P.R.C.P., also looked forward to the era of preventive medicine. But we were a long way yet, he said, from the point at which we could begin to reduce the number of clinicians. Indeed, one of the most notable advances in recent years, the fall in infant mortality, seemed to be leading to more geriatricians—and more psychiatrists! Turning to the poets as public-health teachers, Sir Russell said the more you thought about it the more you saw in Tennyson's words: "An' I thowt 'twur the will o' the Lord, but Miss Annie she said it wur draäins."

Society for the Study of Fertility

The annual conference of this society will be held next year on Thursday and Friday, June 14 and 15, in London.

National Council for the Unmarried Mother and Her Child

At a meeting of this council to be held on Tuesday, Nov. 29, at 2.30 P.M. at the County Hall, Westminster Bridge Road, London, S.E.1, Sir Basil Henriques, Mr. J. Macalister Brew, and Dr. W. Lindesay Neustatter will speak on Fathers.

Scottish By-election

Dr. J. Dickson Mabon, who holds an appointment in the department of public health and social medicine of Glasgow University, has been adopted as Labour candidate in the by-election at Greenock caused by the death of Mr. Hector McNeil.

Hospitals' Symphony Orchestra

This orchestra will give a concert at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on Saturday, Nov. 26, at 7.30 P.M., when the soloist will be Dennis Brain. Tickets (10*s.* 6*d.*, 7*s.* 6*d.*, 5*s.*, and 3*s.* 6*d.*) may be had from Miss M. A. Whipp, lady almoner's department, St. Thomas's Hospital, S.E.1.

A Rauwolfia Preparation

The Rexall Drug Co. Ltd. have announced (*Pharmaceutical Journal*, Nov. 12) that "they have voluntarily withdrawn public advertising of Tranquilex," which is a rauwolfia preparation. This decision has been taken, they say, because a recent report indicates that mental depression can be caused in susceptible individuals by smaller doses of rauwolfia than had previously been suspected. Arrangements are being made for warning labels to be fixed to stocks of tranquilex already in the shops. These will say that the drug should not be taken by people who are depressed and that treatment should be stopped at any sign of depression.

National Medical Manpower Committee

Sir Zachary Cope, consulting surgeon to St. Mary's Hospital, London, has been appointed chairman of the National Medical Manpower Committee, in succession to Lord Haden Guest who has resigned after serving as chairman of this committee and the former Medical Priority Committee for more than ten years. The function of the National Medical Manpower Committee, which was set up in 1952, is to keep under review the best methods of utilising medical manpower and to make recommendations to the Government from time to time. One of the matters with which the committee is concerned is the allocation of doctors to the three Services. Sir Zachary Cope has been chairman of the Central Medical Recruitment Committee since 1952.

Prof. L. J. Witts is to be William McIlrath guest professor in medicine at the Royal Prince Alfred Hospital, Sydney, during August and September of next year.

CORRIGENDUM: *Humoral Effects of Metastasising Carcinoid Tumours.*—In this article by Dr. P. J. D. Snow and his colleagues (Nov. 12, p. 1004) the third and fourth sentences of the second paragraph under "Chromatography" (p. 1007) should read:

"After drying, the papers were sprayed with Ehrlich's solution (2% dimethyl-amino-benzaldehyde in 5% HCl), and heated to 50°C for 10–15 minutes. The spots obtained in this way were usually more intense than those obtained when the paper was allowed to stand at room-temperature. Semi-quantitative estimations . . ."

Also under Chromatography, line 10 of the third paragraph of the section on urine should begin: "200 V, 0·05 M pH 7·5, barbitone buffer) . . ."

Appointments

DAVIES, R. S. G., M.B. Brist.: appointed factory doctor, Fishguard, Pembrokeshire.
HALL, I. M., M.D. Lond.: honorary physician, Hôpital et Dispensaire Français, London.
JONES, U. H., M.R.C.S., D.A.: anæsthetist, Hôpital et Dispensaire Français, London.
LAWRIE, UNA, M.B. Aberd., D.P.H.: asst. M.O., Edinburgh.
MACFARLANE, D. A., M.B., B.SC. Wales, F.R.C.S.: surgical tutor, St. Bartholomew's Hospital, London.
NUTTEN, H. E., M.B. Aberd., D.P.H.: asst. M.O.H., Greenock.
O'BRIEN, P. F., M.B. N.U.I., D.P.M.: senior asst. M.O., Ballinasloe Mental Hospital authority.
PARK, MAX, M.B. Glasg., D.P.H.: deputy M.O.H., West Bromwich.

Diary of the Week

NOV 20 TO 26

Sunday, 20th

COLLEGE OF GENERAL PRACTITIONERS
10 A.M. (Imperial Hotel, Russell Square, London, W.C.1.) Dr. E. B. Hickson, Prof. W. C. W. Nixon, Mr. A. J. Wrigley: The Position of the General-practitioner Obstetrician Today.

Monday, 21st

UNIVERSITY COLLEGE, Gower Street, W.C.1
5.30 P.M. Dr. J. W. Trevan, F.R.S.: Pharmacology of Respiratory Regulation.

Tuesday, 22nd

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. R. D. Harkness: Metabolism of Collagen.
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Medicine.* Sir Russell Brain, Dr. W. Ritchie Russell, Dr. Henry Miller, Mr. J. E. A. O'Connell: Cervical Spondylosis.
ROYAL ARMY MEDICAL COLLEGE, Millbank, London, S.W.1
5 P.M. Brigadier Ian Fraser: Small Intestine.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Dr. R. B. K. Rickford: Clinical Significance of Retroversion of the Uterus and Treatment (if any).
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
12 NOON. (Queen Charlotte's Hospital, Goldhawk Road, W.6.) Prof. J. Young: Maternal Mortality in Great Britain.
INSTITUTE OF DERMATOLOGY, Lisle Street, London, W.C.2
5.30 P.M. Dr. G. C. Wells: The Sebum.
INSTITUTE OF NEUROLOGY
5.30 P.M. (National Hospital, Queen Square, W.C.1.) Dr. J. Hamilton Paterson: Pain in Relation to Lower Limbs.

Wednesday, 23rd

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. B. L. McFarland: The Crooked Tree. (Robert Jones lecture.)
POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Dr. P. M. F. Bishop: Endocrinological Investigations.
ROYAL SOCIETY OF MEDICINE
5 P.M. *Endocrinology.* Prof. A. Querido, Dr. I. Gilliland: Thyrotrophic Hormone.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. G. J. V. Crosby: General Practice and the Public Health.
INSTITUTE OF DISEASES OF THE CHEST, Brompton Hospital, S.W.3
5 P.M. Mr. D. S. P. Barlow: Carcinoma of the Œsophagus.
ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE, 48, Cosway Street, Marylebone Road, N.W.1
5.30 P.M. Dr. W. McIntyre: Schools of Psychotherapy.
BRITISH ASSOCIATION OF SPORT AND MEDICINE
5 P.M. (St. Thomas's Hospital Medical School, Albert Embankment, S.E.1.) Dr. James Cyriax: Clinical Examination of the Injured Athlete. Manual Treatment or Hydrocortisone.
BIRMINGHAM MEDICAL INSTITUTE, 154, Great Charles Street, Birmingham, 3
8 P.M. Prof. P. C. P. Cloake, Dr. R. W. Tibbetts, Mr. E. A. Turner: The Temporal Lobe.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS, 242, St. Vincent Street, Glasgow, C.2
5 P.M. Mr. A. W. Kay: Peptic-ulcer Therapy.

Thursday, 24th

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Prof. J. C. McClure Browne: Isotopes in the Study of Problems of Pregnancy.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. J. O. Oliver: Blood and Bone-Marrow in Skin Diseases.
WEST LONDON MEDICO-CHIRURGICAL SOCIETY
8.30 P.M. (West London Hospital, W.6.) Dr. T. F. Fox: Russia Revisited.
UNIVERSITY OF EDINBURGH, University New Buildings, Teviot Place, 3
5 P.M. Prof. W. Arthur Mackey: Death Following Operation for Mitral Stenosis. (Honyman Gillespie lecture.)
UNIVERSITY OF ST. ANDREWS, Queen's College, Small's Wynd, Dundee
5 P.M. Sir Harold Gillies: Plastic Surgery.

Friday, 25th

ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS, 58, Queen Anne Street, W.1
5.30 P.M. Mr. Arthur Sutherland: Tuberculosis of the Endometrium. (William Blair-Bell lecture.)
POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Mr. H. C. Edwards: Non-specific Granulomata of the Terminal Ileum, Cæcum and Ascending Colon.
4 P.M. Prof. A. W. Woodruff: Filarial Infections.
ROYAL SOCIETY OF MEDICINE
8.15 P.M. *Obstetrics and Gynæcology.* Dr. Joseph Bamforth Dr. G. R. Osborn, Mr. A. J. Wrigley: The Value of Vaginal Cytology in the Diagnosis of Carcinoma.
MIDDLESEX HOSPITAL MEDICAL SCHOOL, London, W.1
5.15 P.M. Dr. Richard L. Riley (Baltimore): Exchange of Gases Between Alveolar Air and the Blood in Man.
MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos Place, W.1
6.45 P.M. Dr. C. S. Nicol: Social Aspects of Gonorrhœa.

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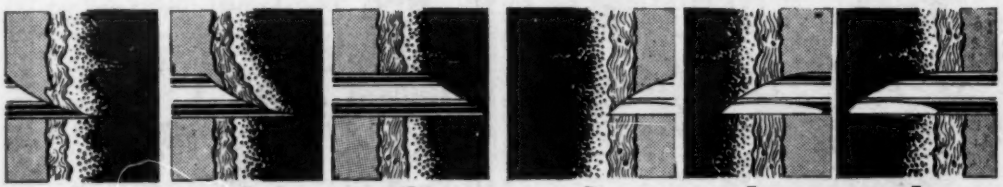

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Vacancies

ACADEMIC AND EDUCATIONAL SECTION *Page* 50

ANÆSTHETICS

Charing Cross, W.C.2. H.O. .. 52
Hackney Group H.M.C. Sr. H.O. .. 52
Highlands Gen., N.21. H.O. .. 52
St. Mary's, W.2. H.O. 53
Birmingham R.H.B. Cons. & P.-t. Cons. 51
Blackburn & Dist. H.M.C. Sr. H.O. .. 55
Blackpool. Victoria. Sr. H.O. .. 55
Bournemouth. Royal Victoria. Sr. H.O. 55
Chichester Group of Hosps. Sr. H.O. 56
Dudley, Stourbridge & Dist. Sr. H.O. 56
Hitchin Hosps. Sr. H.O. 57
Leeds United Hosps. Reg. 58
Luton & Dunstable. Reg. 58
Manchester R.H.B. Reg. 58
Newcastle R.H.B. Sr. Reg. 59
North West Met. R.H.B. Cons. .. 51
Perth Royal Infy. Sr. H.O. 60
Sheffield R.H.B. P.-t. Cons. 51
Welsh R.H.B. Sr. H.M.O. 52
Ibadan, Nigeria. University College Hosp. Reg. & H.O.'s 62

CARDIOLOGY

Newcastle Gen. H.O. 59

CASUALTY

Connaught, E.17. Sr. H.O. 52
Hampstead Gen., N.W.3. Sr. H.O. .. 52
King Edward Mem., W.13. Sr. H.O. 52
North Middlesex, N.18. Sr. H.O. .. 53
Prince of Wales's Gen., N.15. Prereg. H.O. 53
Queen Mary's Hosp. for the East End, E.15. Sr. H.O. 53
Royal Northern, N.7. Sr. H.O. .. 53
St. Leonard's, N.1. Sr. H.O. .. 53
St. Mary's, W.2. Sr. H.O.'s 53
St. Thomas's, S.E.1. Sr. H.O. & H.O. 53
Wanstead, E.11. Sr. H.O. 54
Aylesbury. Royal Bucks. H.O. .. 54
Birmingham. Dudley Road. Sr. H.O. 55
Birmingham R.H.B. Reg. 54
Birmingham. Selly Oak. Sr. H.O. .. 54
Blackburn Royal Infy. Jr. H.M.O. or Sr. H.O. 55
Bury St. Edmunds. West Suffolk Gen. Jr. H.M.O. 55
Cheltenham Gen. & Eye. Sr. H.O. .. 56
Edgware Gen. Sr. H.O. 56
Guildford. Royal Surrey County. Sr. H.O. 56
Leamington Spa. Warneford Gen. Sr. H.O. 58
Maidstone. West Kent Gen. Sr. H.O. 58
Manchester R.H.B. Sr. Casualty Officers 51
Newcastle Gen. H.O. 59
Poole Gen. Sr. H.O. 60
Reading & Dist. H.M.C. Sr. H.O. .. 60
Slough. Upton. H.O. 61
Sunderland Royal Infy. Sr. H.O. .. 61

CHEST AND TUBERCULOSIS

London Chest, E.2. Reg. 52
Birmingham R.H.B. Reg. 54
Bromsgrove. Hill Top. H.O. .. 55
East Anglian R.H.B. Cons. 51
Epping Chest Clinic. P.-t. Asst. Chest Phys. 56
Manchester R.H.B. Sr. H.M.O. .. 51
Rochford, Essex. Gen. Sr. H.O. .. 60
Skipton. The Hosp. Sr. H.O. or Jr. H.M.O. 61
Stirling & Clackmannan Hosps. B.O.M. Jr. H.M.O. 61
Ventnor, I.W. Royal Nat. Hosp. for Diseases of Chest. Jr. H.M.O. or Sr. H.O. 62
Woodford Green, Essex. Harts. Sr. H.O. 62

DERMATOLOGY

St. Thomas's, S.E.1. P.-t. Cons. .. 50
Chertsey. St. Peter's. P.-t. Clin. Asst. (G.P.) or P.-t. Reg. 56

EAR, NOSE, AND THROAT

Shrewsbury. Eye, Ear & Throat. Sr. H.O. 61
Northern Ireland Hosps. Auth. Reg. 62

GERIATRICS

Whipps Cross, E.11. H.O. 54
Whittington, N.19. Sr. H.O. .. 54
Newcastle Gen. H.O. 59
Pontefract & Castleford H.M.C. Jr. H.M.O. 60

HÆMATOLOGY

Scottish Nat. Blood Transfusion Assoc. & North-Eastern R.H.B. Cons. .. 52

INFECTIOUS DISEASES

Southampton Chest. Sr. H.O. .. 61
Stoke-on-Trent. Bucknall. Jr. H.M.O. 61

MEDICINE

Bow Group H.M.C. H.O. 52
Lambeth, S.E.11. H.O. 52
Mile End, E.1. H.O. 53
Royal Free, W.C.1. Jr. H.M.O.'s .. 52
South Western, S.W.9. H.O. .. 54
St. Bartholomew's, E.C.1. P.-t. Cons. 50

St. Leonard's, N.1. H.O. 53
St. Thomas's, S.E.1. H.O. 53
Whittington, N.19. H.O.'s 54
Woolwich Group H.M.C. H.O.'s .. 54
Alexandria, Dunbartonshire. Vale of Leven. H.O. 54
Alton Gen. Sr. H.O. 54
Barnsley. Beckett. Sr. H.O. 54
Bideford & Dist. H.O. 54
Birmingham R.H.B. Regs. 54
Birmingham. Solihull. Sr. H.O. .. 55
Bolton Dist. Gen. H.O. 55
Bournemouth. Christchurch. Pre-reg. H.O.'s 55
Bournemouth. Royal Victoria. H.O. 55
Bromsgrove Gen. Pre-reg. H.O. .. 55
Chichester. St. Richard's. Sr. H.O. .. 56
Derby. Derbyshire Royal Infy. Pre-reg. H.O. 56
Dudley, Stourbridge & Dist. Pre-reg. H.O. 56
Edgware Gen. H.O.'s 56
Epping. St. Margaret's. Pre-reg. H.O. 56
Hemel Hempstead. West Herts. Pre-reg. H.O. 57
Hertford County. H.O. 57
Hexham Gen. Pre-reg. H.O. .. 57
Huddersfield Royal Infy. H.O. .. 57
Kidderminster & Dist. Gen. Pre-reg. H.O. 57
Leeds United Hosps. Reg. & Sr. H.O. 57/58
Liverpool. Waterloo. Jr. H.M.O. .. 58
Manchester. West Manchester H.M.C. Sr. H.O. 59
Newcastle Gen. H.O.'s 59
Newmarket Gen. H.O. 59
Newton Abbot. Sr. H.O. 59
Plymouth. South Devon & East Cornwall. Pre-reg. H.O. 60
Richmond, Surrey. Royal. Pre-reg. H.O. 60
Romford. Oldchurch. H.O. 60
Ryde, I.W. Royal Isle of Wight County. Pre-reg. H.O. 60
St. Albans City. H.O. 61
Stockport & Buxton H.M.C. H.O.'s 61
Swindon & Dist. H.M.C. H.O.'s .. 61
Winchester. Royal Hants County. Pre-reg. H.O. 62
Wolverhampton Group. Pre-reg. H.O. 62
Ibadan, Nigeria. University College Hosp. H.O.'s & Pre-reg. H.O.'s .. 62
New York City Suburb. Hempstead Gen. H.O.'s.. 62

NEUROLOGY

Birmingham R.H.B. P.-t. Cons. .. 51

NEUROSURGERY

Bristol. Cossham/Frenchay H.M.C. Sr. H.O. 55
Romford. Oldchurch. Sr. H.O. .. 60
Sheffield United Hosps. Cons. .. 50

OBSTETRICS AND GYNÆCOLOGY

Charing Cross, W.C.2. Reg. 53
Hackney, E.9. Sr. H.O. 52
Lambeth, S.E.11. H.O. 52
Mile End, E.1. Sr. H.O. & H.O.'s .. 52
Tottenham Group H.M.C. H.O.'s .. 53
Whittington, N.19. H.O. 54
Woolwich Group H.M.C. H.O.'s .. 54
Aylesbury. Royal Bucks. H.O. .. 54
Aylesbury. Stoke Mandeville. H.O. 54
Bedford Gen. Pre-reg. H.O. 54
Cheltenham Maternity. H.O. 56
East Anglian R.H.B. Reg. 56
Glasgow. Southern Gen. Locum Sr. H.O. 57
Hitchin. North Herts. H.O. .. 57
Manchester United Hosps. H.O.'s & Pre-reg. H.O.'s 58
Newcastle upon Tyne H.M.C. & Hexham & Dist. H.M.C. Pre-reg. H.O.'s 59
Newmarket Gen. Sr. H.O. 59
Nottingham City. Sr. H.O. or H.O. .. 59
Romford. Oldchurch. Sr. H.O. .. 60
Romford. Rush Green. H.O. .. 60
Stockport & Buxton H.M.C. H.O. .. 61
Swansea. Mount Pleasant. Sr. H.O. 61
Taplow. Canadian Red Cross Mem. H.O. 61
York. Maternity & Fulford Hosps. Sr. H.O. 62
Ibadan, Nigeria. University College Hosp. H.O.'s & Pre-reg. H.O.'s.. 62

OPHTHALMOLOGY

St. Bartholomew's, E.C.1. H.O. .. 53
Aylesbury. Royal Bucks. H.O. .. 54
Maidstone. Kent County Ophthalmic & Aural. Sr. H.O. 58
Manchester United Hosps. Reg. .. 59
Southampton Eye. Sr. H.O. 61

ORTHOPÆDICS

Royal National Orthopædic, Stanmore. Sr. H.O.'s 53
Royal Northern, N.7. Reg. 53
Beverley. Westwood. H.O. 54
Blackpool Victoria. H.O. 55
Brighton. Gen. H.O. 55
Burton-on-Trent Gen. H.O. or Locum 55
Hexham Gen. Pre-reg. H.O. .. 57
Ilford. King George. Sr. H.O. .. 57
Ipswich & East Suffolk. H.O. .. 57
Ipswich & East Suffolk. Sr. H.O.'s.. 57
Lewes. Chailey Heritage (Craft School & Hosp.). H.O. 58
Liverpool United Hosps. Sr. H.O. .. 58
Manchester R.H.B. Sr. Reg. .. 58
Manchester R.H.B. P.-t. Cons. .. 51
Margate. Royal Sea Bathing. Sr. H.O. 58
Newcastle R.H.B. Reg. 59
Nottingham Gen. Sr. H.O. 60
Peterborough Mem. Sr. H.O. 60
Salisbury Gen. H.O. 61
Sheffield United Hosps. Sr. Reg. .. 61
South East Met. R.H.B. P.-t. Cons. 51
Wolverhampton Group. Sr. H.O. or H.O. 62

PÆDIATRICS

St. Thomas's, S.E.1. H.O. 53
Whittington, N.19. Reg. 54
Blackburn & Dist. H.M.C. Sr. H.O. 55
Carshalton. Queen Mary's Hosp. for Child. Reg. 56
Glasgow. Royal Hosp. for Sick Child. H.O.'s 56
Halifax Gen. H.O. 57
Hull. Victoria Hosp. for Sick Child. H.O. 57
Ipswich & East Suffolk. Sr. H.O. .. 57
Manchester United Hosps. H.O. .. 59
Newcastle Gen. H.O.'s 59
Newcastle R.H.B. Cons. 51
Southampton & Winchester H.M.C.'s. Reg. 61
South East Met. R.H.B. Reg. .. 61
Worcester Royal Infy. H.O. 62
Ibadan, Nigeria. University College Hosp. H.O.'s 62

PATHOLOGY

Group Lab. Mile End Hosp., E.1. Sr. H.O. 52
Royal Masonic, W.6. Cons. 50
Manchester R.H.B. Sr. Reg. .. 58
Manchester. Wythenshawe. Sr. H.O. 58
Newcastle R.H.B. Sr. Reg. & Reg. 59
North West Met. R.H.B. Sr. H.M.O. 51
Northwood. Mount Vernon Hosp. & Radium Inst. Reg. 59
Reading. Royal Berks. H.O. 60
Sheffield United Hosps. Sr. H.O. .. 61
Wolverhampton Group. Jr. H.M.O. .. 62

PLASTIC SURGERY

Manchester. Wythenshawe. Sr. H.O. 58

PSYCHIATRY

St. Thomas's, S.E.1. H.O. 53
Bromgrove. Barnsley Hall Hosp. for Mental & Nervous Diseases. Jr. H.M.O. 55
Birmingham. Rubery Hill. Jr. H.M.O. 54
Cambridge. Fulbourn. Sr. H.O. .. 55
Canterbury. St. Augustine's. Jr. H.M.O. 56
Carlisle. Garlands. Jr. H.M.O. .. 55
Greenock. Ravenscraig. Jr. H.M.O. 57
Lancaster. Royal Albert H.M.C. Jr. H.M.O. 58
Leeds R.H.B. Cons. 51
Leeds United Hosps. Sr. H.O. .. 58
Manchester. Springfield. Jr. H.M.O. 59
Oxford University & R.H.B. Sr. Reg. 60
Sheffield R.H.B. Sr. H.M.O. 51
Sheffield R.H.B. Sr. Reg. 61
South East Met. R.H.B. P.-t. Cons. 51
Welsh R.H.B. Reg. 61
New York. Albany. Residencies .. 62

RADIOLOGY

Leeds R.H.B. Locum P.-t. Cons. .. 51
Leeds United Hosps. Sr. Reg. .. 58
Manchester R.H.B. Sr. Regs. .. 58
Oxford United Hosps. Sr. Reg. 60
Scotland. Eastern R.H.B. Cons. .. 51
New Zealand. Otago Hosp. Board. Jr. or Sr. Specialist 52

RADIOTHERAPY

Guy's, S.E.1. Reg. 52
Manchester R.H.B. Sr. Reg. .. 58
Northwood. Mount Vernon. H.O. .. 59

RHEUMATOLOGY

St. Stephen's, S.W.10. H.O. .. 53
Aylesbury. Stoke Mandeville. Sr. H.O. 54

SURGERY

Bolingbroke, S.W.11. H.O.'s 52
Central Middlesex, N.W.10. H.O. .. 52
Central Middlesex, N.W.10. Reg. .. 52
Connaught, E.17. H.O. 52
London Jewish, E.1. H.O. 52
North Middlesex, N.18. Pre-reg. H.O. 53
Royal Marsden, S.W.3. H.O.'s .. 53
Royal Marsden, S.W.3. P.-t. Sr. Reg. 53
St. Ann's, N.15. Sr. H.O. & H.O. .. 53
Whittington, N.19. H.O.'s 54
Woolwich Group H.M.C. H.O.'s .. 54
Alexandria, Dunbartonshire. Vale of Leven. H.O. 54
Barnstaple. North Devon Infy. Pre-reg. H.O. 54
Bedford Gen. Pre-reg. H.O.'s .. 54
Birmingham Accident. H.O.'s .. 54
Birmingham R.H.B. Regs. 54
Blackpool. Victoria. Pre-reg. H.O.'s 55
Bournemouth. Royal Victoria. H.O.'s 55
Brighton Gen. H.O. 55
Bromsgrove Gen. Pre-reg. H.O. .. 55
Bury St. Edmunds. West Suffolk Gen. H.O.'s 55
Canterbury. Kent & Canterbury. H.O. 56
Chelmsford. St. John's. H.O. .. 55
Cheltenham Gen. & Eye. H.O.'s .. 55
Chichester. Royal West Sussex. H.O. 56
Chichester. St. Richard's. Pre-reg. H.O.'s 56
Derby. Derbyshire Royal Infy. Pre-reg. H.O. 56
Dovercourt. Harwich & Dist. Sr. H.O. 56
Dudley, Stourbridge & Dist. Pre-reg. H.O. 56
Dunfermline & West Fife. H.O. .. 56
Enfield. Chase Farm. H.O. 56
Epping. St. Margaret's. Pre-reg. H.O. 56
Epsom Dist. Pre-reg. H.O.'s 56
Glasgow. Royal Hosp. for Sick Child. H.O.'s 56
Hastings. Buchanan. Sr. H.O. .. 57
Hertford County. H.O. 57
Hexham Gen. Pre-reg. H.O.'s .. 57
Hitchin. Lister. H.O. 57
Hitchin. North Herts. H.O. 57
Hounslow, Middx. H.O. 57
Huntingdon County. H.O. 57
Ipswich & East Suffolk. H.O. .. 57
Kidderminster & Dist. Gen. Pre-reg. H.O.'s 57
Leamington Spa. Warneford Gen. H.O. 58
Leicester Royal Infy. Pre-reg. H.O. .. 58
Manchester R.H.B. Sr. Reg. .. 58
Newcastle Gen. H.O.'s 59
Newcastle R.H.B. Reg. 59
Newmarket Gen. H.O. 59
Northwood. Mount Vernon. H.O. .. 59
Nottingham Highbury. Sr. H.O. .. 60
Oxford Univ. & United Hosps. Sr. Reg. 60
Plymouth. South Devon & East Cornwall. Sr. HO. & Pre-reg. H.O.'s 60
Poole Gen. Pre-reg. H.O. 60
Porth & Dist. Jr. H.M.O. 60
Richmond, Surrey. Royal. Pre-reg. H.O. 60
Ryde, I.W. Royal Isle of Wight County. Pre-reg. H.O. 60
Salisbury Gen. H.O. 61
Scotland. Eastern R.H.B. Cons. .. 51
Southampton Gen. H.O.'s 60
Southampton. Royal South Hants. H.O. 60
Southport Gen. Infy. H.O. 60
St. Albans City. H.O.'s 61
Stockport & Buxton H.M.C. H.O.'s 61
Swindon & Dist. H.M.C. H.O.'s .. 61
Winchester. Royal Hants & County. H.O. 62
Windsor. King Edward VII. H.O. 62
Worcester Royal Infy. H.O.'s .. 62
Ibadan, Nigeria. University College Hosp. Reg., H.O.'s & Pre-reg. H.O.'s 62

THORACIC SURGERY

London Chest, E.2. Sr. H.O. or Reg. 52
St. Thomas's, S.E.1. H.O. 53
Godalming. Milford Chest. Locum Sr. Reg. 56
Harefield Hosp. Regional Thoracic Surgical Unit. Reg. 57
Nottingham City. Sr. H.O. 60
Malaya. Lady Templer Tuberculosis Hosp., Kuala Lumpur. Surgeon .. 51

GENERAL

New York. Albany. Internships & Residencies 62
PUBLIC APPOINTMENTS 62
GENERAL PRACTICE 64
NON-MEDICAL 64
MISCELLANEOUS 64

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies but candidates may normally visit the hospital by appointment.

Academic and Educational

UNIVERSITY OF LONDON
INSTITUTE OF ORTHOPÆDICS

COURSE IN NEUROLOGY IN ORTHOPÆDICS
28TH NOVEMBER–2ND DECEMBER, 1955

Monday, 28th November—Town Section
Electrical examination in neuro-muscular disorders .. Mr. D. M. BROOKS
Spina bifida .. Mr. J. I. P. JAMES
Some deformities associated with neurological disorders (1) .. Dr. P. H. SANDIFER
Mr. J. I. P. JAMES
Pathology of poliomyelitis .. Dr. H. A. SISSONS
Tuesday, 29th November—Town Section
Some deformities associated with neurological disorders (2) .. Dr. P. H. SANDIFER
Traumatic paraplegia .. Dr. L. GUTTMANN
Cerebral palsies of infancy (1) .. Dr. P. H. SANDIFER
Wednesday, 30th November—Town Section
Pathology of muscle .. Dr. H. A. SISSONS
Cervical disc lesions .. Mr. H. O. CLARKE
Cerebral palsies of infancy (2) .. Dr. P. H. SANDIFER
Nerve injuries at the wrist .. Mr. H. J. SEDDON
Pathology and diagnosis of intervertebral disc lesions .. Mr. H. J. BURROWS
Thursday, 1st December—Country Section
Poliomyelitis—early treatment .. Mr. D. M. BROOKS
Surgery of spastic paralysis .. Mr. K. I. NISSEN
Compression paraplegia .. Mr. V. LOGUE
Friday, 2nd December—Country Section
Poliomyelitis—late treatment .. Mr. J. A. CHOLMELEY
Clinical demonstration .. Mr. D. TREVOR
Nerve injuries complicating fractures .. Mr. H. J. SEDDON

The fee for this course (including lunch and tea) is 7 guineas. Early application should be made to the Dean, at 234, Great Portland-street, London, W.1.

UNIVERSITY OF MANCHESTER

DIPLOMA IN MEDICAL RADIOTHERAPY (R.C.P. AND S. ENG.)

A COURSE of instruction in Radiotherapy will begin at the Christie Hospital and Holt Radium Institute, Manchester, on MONDAY, 2ND APRIL, 1956. This will continue until the end of JANUARY, 1957, after which students must still spend a further 15 months working either in the Holt Radium Institute or in another approved hospital. The course is full-time, non-resident: inclusive fee £52.

Applications are invited from registered medical practitioners who fulfil the requirements as to previous medical experience laid down by the Examining Board in England (D.M.R.T. regulations obtainable from the London Conjoint Board, 8–11, Queen-square, London, W.C.1).

There may be appointments under the National Health Service at Senior House Officer or Registrar level for successful candidates. Special consideration will be given to candidates possessing a higher qualification in medicine or surgery.

Further information may be obtained from Dr. RALSTON PATERSON, Director, Christie Hospital and Holt Radium Institute, Wilmslow-road, Manchester, 20, or from the Dean of the Postgraduate Medical Studies, The University, Manchester, 13, to whom applications should be sent not later than 2nd January, 1956.

THE ROYAL LONDON HOMŒOPATHIC HOSPITAL
Great Ormond-street and Queen-square, London, W.C.1

COURSES OF INSTRUCTION IN THE PRINCIPLES AND PRACTICE OF HOMŒOPATHY for Medical Practitioners and Senior Students of Medicine.

WINTER COURSE

These Lectures, which commence on FRIDAY, 6TH JANUARY, at 2.30 P.M., are given under the auspices of the Homœopathic Research and Educational Trust and deal with the subjects required for examination for the Diploma of The Faculty of Homœopathy. Fee for registered medical practitioners, £10 10s. per session; medical students admitted without charge.

Full particulars can be obtained on application to the Dean of the Education Course at the Hospital.

UNIVERSITY OF ST. ANDREWS
QUEEN'S COLLEGE, DUNDEE

CHAIR OF MIDWIFERY AND GYNÆCOLOGY (FULL-TIME)

The University Court invites applications for the Chair of Midwifery and Gynæcology in the University. The Professor will be a member of Queen's College, Dundee. The salary attached to the Chair is £2850 p.a. plus F.S.S.U. and family allowances. A grant towards the expenses of removal may be made.

Applications (30 copies) including the names of 3 referees, must be submitted by 1st January, 1956, to the undersigned, from whom further particulars may be obtained.

PATRICK CUMMING, Joint Clerk
to the University Court, Queen's College, Dundee.
9th November, 1955.

UNIVERSITY OF DURHAM. King's College, Newcastle upon Tyne. The Council of King's College invite applications for the post of LECTURER IN PHYSIOLOGY. Applicants should be medically qualified. The Lecturer's main responsibility will be in the teaching of medical students. The appointment will be on one of the Lecturers scales, of which the maxima are £1450 and £1750. The commencing salary of the successful applicant will be fixed on one or other scale in accordance with his qualifications and experience.

Applications (12 copies), together with the names of 3 persons to whom reference may be made, should be submitted not later than 10th December, 1955, to the undersigned, from whom further particulars may be obtained.

G. R. HANSON, Registrar of King's College.

BRITISH POSTGRADUATE MEDICAL FEDERATION
UNIVERSITY OF LONDON

POSTGRADUATE TRAVELLING FELLOWSHIPS

The Governing Body of the British Postgraduate Medical Federation invites applications from registered medical or dental practitioners for a limited number of Postgraduate Travelling Fellowships. The aim of the Fellowships is to enable graduates who are in the course of training as specialists in 1 of the preclinical or clinical branches of medicine, surgery, or dentistry, to obtain experience of the methods of practice, education, and research at universities or other centres in the United Kingdom and abroad. Candidates must be British subjects who are holding an appointment or are engaged in postgraduate study at 1 of the undergraduate or postgraduate teaching hospitals or medical or dental schools or postgraduate institutes of the University of London. The Fellowships will normally be tenable for 1 year, and the successful candidates will be expected to commence work in SEPTEMBER or OCTOBER, 1956. The value of the Fellowships is not less than £750 p.a. and, in addition, allowances are paid for study abroad, for dependants in the case of married Fellows, and for travelling.

Applications must be submitted before 10th December, 1955, and further information and application forms may be obtained from the Assistant Director, British Postgraduate Medical Federation, Central Office, 2, Gordon-square, London, W.C.1.

BRITISH POSTGRADUATE MEDICAL FEDERATION (UNIVERSITY OF LONDON), INSTITUTE OF CARDIOLOGY. Applications are invited for the post of FIRST ASSISTANT to the Academic Unit, vacant as from 1st January, 1956. The successful candidate will have the status of a Senior or Junior Lecturer, salary scale either £1500–£100–£1800 p.a. or £1000–£100–£1300 p.a., according to qualifications and experience. Superannuation under the F.S.S.U. The appointment is for 1 year in the first instance but may be extended annually up to a maximum of 5 years.

Applications, together with the names of 3 referees, should be sent to the Dean at 35, Wimpole-street, W.1, not later than 2nd December, 1955.

THE MEDICAL COLLEGE OF ST. BARTHOLOMEW'S HOSPITAL, West Smithfield, E.C.1. Applications are invited for the post of LECTURER IN ANATOMY tenable as from 1st January, 1956. The salary will be on a scale of £900–£100–£1400 p.a. together with children's allowance and membership of the F.S.S.U. The commencing point on the scale will depend upon academic qualifications and experience in teaching and research.

Applications which should be received not later than 30th November, 1955, should be addressed to the Dean of the Medical College, from whom further particulars may be obtained.

AUSTRALIA. UNIVERSITY OF QUEENSLAND. Applications are invited for the position of LECTURER IN BIOCHEMISTRY in the Department of Pathology. Salary £A1100–£A1450 p.a. The applicant will be required to carry out routine and investigational work in the biochemistry of blood and its disorders.

Further particulars and application forms are obtainable from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1. Applications close, in Australia and London, on 31st January, 1956.

Hospital Services : Senior Appointments

ROYAL MASONIC HOSPITAL, Ravenscourt Park, London, W.6. Applications are invited for the post of CLINICAL PATHOLOGIST. The Hospital would prefer the appointment to be whole-time, but would consider applicants prepared to give not less than 8/11ths of whole-time. The post carries Consultant status and will be available as from a date to be arranged in January, February, or March, 1956. The present Hospital has about 200 Beds, and an extension is being planned for approximately 90 Beds. This extension will include a new Pathological Department, and it is hoped to start building work in January, 1956.

Applications should reach the undersigned (from whom further information may be obtained) on or before 30th November, 1955.

R. E. LAWSON, Secretary and House Governor.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Appointment of ASSISTANT PHYSICIAN. Applications are invited for the post of Part-time Consultant in General Medicine at above Hospital. The appointment, which will be for 5 sessions weekly, is tenable from 1st April, 1956, and the successful candidate will be required to act as the Assistant Director to the Medical Unit for a period of two years, during which times the Medical College will make up his salary to that of a maximum part-time Consultant, or such proportion as may be agreed. Candidates must be in possession of the Fellowship or Membership of the Royal College of Physicians of London.

Applications (single copy), together with the names of 3 referees, should be submitted to the undersigned within the next 21 days.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. THOMAS'S HOSPITAL, London, S.E.1. Physician to the Skin Department. Consultant status with membership of the Medical Committee. 4 sessions per week. Vacant August, 1956.

Applications (12 copies), naming 3 referees, to the Clerk of the Governors by 10th December, 1955.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the post of CONSULTANT ASSISTANT NEUROSURGEON, whole-time or maximum part-time at the option of the successful candidate.

Applications (15 copies), stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 31st December, 1955, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1, from whom further particulars may be obtained.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT ANÆSTHETIST for the Sheffield No. 1 Hospital Management Committee Group with duties mainly at the City General Hospital, Sheffield. This Hospital has teaching affiliations with the University of Sheffield. There are Professorial Medical and Gynæcological Units, a Department of Thoracic Surgery and a Regional Cardiological Centre.

Further details and application forms from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 10th December, 1955.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Kingsway Hospital, Derby. Salary scale £1500–£50–£1950.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 10th December, 1955.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

Dudley and Stourbridge Group

Part-time CONSULTANT ANÆSTHETIST (9 notional half-days weekly). Duties mainly at Guest Hospital, Dudley (154 Beds); also at Wordsley Hospital (372 Beds); Corbett Hospital, Stourbridge (106 Beds).

Part-time CONSULTANT ANÆSTHETIST (8 notional half-days weekly). Duties at Wordsley Hospital (6 notional half days) and Corbett Hospital (2 notional half-days).

Birmingham (Dudley Road) Group

Whole-time CONSULTANT ANÆSTHETIST. Duties at Dudley Road Hospital (6 notional half-days), Eye and E.N.T. Hospital (5 notional half-days).

Experience specialty and all posts D.A. (Parts I and II) or F.F.A.R.C.S. required.

Stratford-on-Avon/Warwick Hospitals

Part-time CONSULTANT NEUROLOGIST (1 notional half-day fortnightly). Considerable experience specialty essential.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 5th December, 1955.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. CONSULTANT CHEST PHYSICIAN (whole-time) in Cambridge Area. The successful candidate will be in charge of the area chest clinic, with beds at an Isolation Hospital in the area and with access to beds at Papworth Hospital. By agreement with the Boards of Governors of the United Cambridge Hospitals, an honorary contract will be granted to cover work undertaken in the Teaching Hospital Group. The duties will include work in preventive-care and after-care services of the Local Authorities concerned. Higher qualification and wide experience in diseases of the chest and tuberculosis essential.

Applications (12 copies), stating age, experience and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 5th December, 1955.

LEEDS REGIONAL HOSPITAL BOARD. Locum CONSULTANT RADIOLOGIST (9 sessions) for duties at hospitals in the Bradford A Group, including the Bradford Royal Infirmary and St. Luke's Hospital, Bradford. The appointment will be for a minimum period of 15 months.

Applications, stating age, qualifications and experience, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PSYCHIATRIST AND PHYSICIAN SUPERINTENDENT at De la Pole Hospital, Willerby, near Hull (1000 Beds—including female Neurosis Unit). The duties of the appointment will also include attendances at the Hull Royal Infirmary, occasional visits to other hospitals in Hull A, Hull B, and Goole, Howden and Selby Groups, the Industrial Rehabilitation Unit at Hull and at the proposed joint Psychiatric Centre with the Hull Corporation. Candidates should hold high qualifications in medicine and psychiatry and have had experience of administrative aspects of the specialty. The successful candidate will be non-resident but would be required to reside within 5 miles of the De la Pole Hospital.

Applications (12 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 17th December, 1955.

NEWCASTLE REGIONAL HOSPITAL BOARD. South SHIELDS DISTRICT HOSPITAL MANAGEMENT COMMITTEE GROUP. (Main Hospitals—General, 602 Beds (children's ward 19 Beds plus maternity unit 46 Beds), Ingham Infirmary, 158 Beds (children's ward 34 Beds).) CONSULTANT PÆDIATRICIAN, whole-time or part-time for minimum of 9 sessions per week. To be linked with Sunderland Pædiatric Service (Sunderland Children's Hospital—77 Beds).

Applications, with names and addresses of 3 referees, to the Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) ASSISTANT PATHOLOGIST (whole-time), Senior Hospital Medical Officer grade, in the Department of Morbid Anatomy, West Herts Group of hospitals. Duties based on Watford Peace Memorial Hospital. Post vacant 1st April, 1956.

Applications by 17th December, 1955.

(2) CONSULTANT ANÆSTHETIST (whole-time or maximum sessions), Luton Group of hospitals. Duties mainly at Luton and Dunstable Hospital, Luton (250 Beds).

Applications by 30th December, 1955.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Part-time (7 notional half-days) CONSULTANT TRAUMATIC AND ORTHOPÆDIC SURGEON to the Macclesfield and District Hospital Centre (Macclesfield General Hospital, Congleton War Memorial Hospital, Alderley Edge Cottage Hospital, &c.). Appointee will be required to devote a portion of his time to the organisation and supervision of the accident services and to live in or near Macclesfield. Wide experience essential. 30th November, 1955.

(*b*) Whole-time NON-RESIDENT ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer) to the Wigan and Leigh Hospital Centre, including the Tuberculosis Unit at Wrightington Hospital. Previous experience of thoracic medicine and tuberculosis essential, higher qualification desirable. The appointment may be made in conjunction with the Local Health Authorities concerned, for whom the appointee would carry out duties in connection with prevention, care and aftercare of tuberculosis. 30th November, 1955.

(*c*) 2 Whole-time SENIOR CASUALTY OFFICERS :—

(i) Preston Royal Infirmary—resident or non-resident.

(ii) Victoria Hospital, Accrington—resident.

Appointees will work under general supervision of Consultants. Tenure of posts limited to 4 years; salary within range of £1500–£50–£1950 (according to experience, &c.). 28th November, 1955.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

MALAYA. THE LADY TEMPLER TUBERCULOSIS HOSPITAL, KUALA LUMPUR, MALAYA. The Board of Governors of The Lady Templer Tuberculosis Hospital, Kuala Lumpur, a newly established and independent hospital, invite applications from those of Consultant rank or possessing considerable experience of thoracic surgery for the appointment of THORACIC SURGEON to organise and take charge of the Surgical Unit. The Hospital is modern with fully up-to-date ancillary services. Candidates must be fully registered by the General Medical Council. The appointment will be on a short-term contract with a maximum of 3 years service. The basic salary payable will be 1440 $ per month, plus (if married) 570 $ per month cost-of-living and expatriation allowance totalling 2010 $ (£246 6s. equivalent). On satisfactory completion of the contract a gratuity (taxable) is payable at the rate of £450 for each completed year of service. Free first-class passages to and from Malaya are provided for expatriate Officers and their wives, leave on full pay at the end of the contract is earned at the rate of 60 days for each year of completed service, and good furnished quarters are provided at a nominal rent. Regulated consultant practice is allowed, in connection with which a proportion of the fees will be retained.

Applications, stating date of birth, qualifications and experience, with the names of 3 referees, to be sent care of House Governor, Brompton Hospital, Fulham-road, S.W.3, by 24th December, 1955, from whom further details may be obtained on request.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT PSYCHIATRIST to undertake 9 notional half-days a week for child guidance work at the Hastings Child Guidance Clinic, 33, Cambridge-road, Hastings, Sussex, and the Herbert Hone Clinic, 15/17, Princes-street, Brighton, which are administered by the local education authorities of East Sussex and Brighton respectively. Candidates must have had previous extensive experience of child guidance. Possession of a D.P.M. is essential and preferably a higher qualification. Applicants may visit the clinics.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, by 3rd December, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT ORTHOPÆDIC SURGEON (5 notional half-days a week) to the Brighton and Lewes and Mid-Sussex Groups of hospitals. The successful candidate will be required to reside locally. Candidates must have had wide experience in orthopædic surgery and possess a Fellowship of a Royal College of Surgeons, or a Mastership in Surgery. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 3rd December, 1955.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. Radiodiagnosis. ANGUS AREA. Applications are invited for the whole-time post of RADIOLOGIST (Consultant) at Stracathro Hospital, Brechin (675 Beds), Brechin Infirmary (106 Beds), Arbroath Infirmary (105 Beds) and other hospitals in the Angus area. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 12th December, 1955.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. General Surgery. BRIDGE OF EARN HOSPITAL, PERTHSHIRE. Applications are invited for the whole-time post of SURGEON (Consultant) in charge of the General Surgical Unit of 70 Beds at Bridge of Earn (General) Hospital, Perthshire (806 Beds). Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 12th December, 1955.

SCOTTISH NATIONAL BLOOD TRANSFUSION ASSOCIATION AND NORTH-EASTERN REGIONAL HOSPITAL BOARD, SCOTLAND. Consultant appointment. Applications are invited from registered medical practitioners with suitable qualifications and experience for the post of DIRECTOR of the North-East of Scotland Blood Transfusion Service. The laboratories of the service are located at the Royal Infirmary, Aberdeen. Experience and interest in aspects of clinical pathology related to blood transfusion and hæmatology generally are considered to be desirable. The successful applicant will be accorded a part-time appointment on the staff of the North-Eastern Regional Hospital Board with duties mainly in the hospitals in Aberdeen. The salary for the joint appointment, which is superannuable, is in the range £2100–£3100.

Applications, together with the names and addresses of 3 referees, should be sent not later than 30th November, 1955, to CHARLES S. GUMLEY, W.S., Secretary to the Scottish National Blood Transfusion Association, 10, Duke-street, Edinburgh, 1.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT ANÆSTHETIST (Senior Hospital Medical Officer) to serve Plastic Surgery Centre, St. Lawrence Hospital, Chepstow (109 plastic surgery, 50 orthopædic beds), with occasional visits elsewhere if required. Preference given to candidates possessing a Diploma in Anæsthetics. Successful candidate will work under Consultant-in-charge.

Applications (12 copies), together with names of 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

NEW ZEALAND. THE OTAGO HOSPITAL BOARD, DUNEDIN. Applications are invited for the position of DIAGNOSTIC RADIOLOGIST, Otago Hospital Board. Applicants must hold a degree in Medicine of an approved University and possess a higher qualification in the specialty. The salary payable will be that of a Junior or Senior Specialist under the Hospital Employment Regulations—viz., £1290–£1940 p.a., plus general wage increase of £81 7s. p.a. The commencing salary will be determined in accordance with the qualifications and experience of the appointee. The position is a full-time and non-resident one. Travelling expenses as set out in the conditions of appointment will be paid when a contract of service is signed.

Conditions of appointment and application forms may be obtained from the Office of the High Commissioner for New Zealand, 415, Strand, London, from the undersigned or from THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2. Applications, stating age, qualifications and experience, together with testimonials, health and radiological certificates, will be received by the undersigned until 10 A.M. on Monday, 16th January, 1956. W. A. WILLIAMSON, Secretary.

Otago Hospital Board, P.O. Box 946, Dunedin, New Zealand.

Hospital Services : Junior Appointments

BOLINGBROKE HOSPITAL, Wandsworth Common, S.W.11. HOUSE SURGEONS (2) (resident), required from 4th and 6th December, 1955. Open to registered practitioners and pre-registration candidates.

Apply Hospital Secretary, enclosing copies of 3 recent testimonials, by 22nd November, 1955.

BOW GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (not pre-registration) for general medical wards. Post vacant early part of December, 1955.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be sent to the Hospital Secretary, St. Clement's Hospital, 2A, Bow-road, E.3.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in General Surgical Department. Appointment for 6 months from 1st January, 1956. Pre-registration candidates will be considered.

Applications, with 2 testimonials, to Medical Director by 26th November, 1955.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SURGICAL REGISTRAR required. Whole-time, resident when on duty. Will include outpatient sessions and teaching. Post vacant February, 1956. Hospital may be visited by appointment.

Application forms from, and returnable to, Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 29th November, 1955.

CHARING CROSS HOSPITAL, W.C.2. Resident Anæsthetist (post-registration post), recognised for the D.A. Tenable as soon as possible for 6 months.

Applications to the undersigned by 28th November, 1955.

FRANK HART, Secretary to the Board.

CHARING CROSS HOSPITAL, W.C.2. Full-time Gynæcological and Obstetric Registrar. Tenable from 1st February, 1956, for 1 year in the first instance, with eligibility for renewal.

Applications to the undersigned, stating date of birth, qualifications, and experience, and the names of 3 referees, by 12th December, 1955. FRANK HART, Secretary to the Board.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) Applications are invited for the post of SECOND CASUALTY OFFICER with duties in the Department of Orthopædic and Traumatic Surgery (Senior House Officer grade). Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) HOUSE SURGEON required for 6 months (General Surgery and Special Departments). Post vacant 16th December, 1955. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

GROUP LABORATORY, MILE END HOSPITAL, Bancroft-road, London, E.1. RESIDENT ASSISTANT PATHOLOGIST (Senior House Officer grade). Previous experience an advantage but not essential. Laboratory recognised for Diploma of Pathology and is well equipped with excellent training facilities. Post tenable for 1 year in first instance.

Applications, stating age, nationality, qualifications, and experience, together with the names of 2 referees, to the Secretary, Stepney Group Hospital Management Committee, Raine-street, Wapping, E.1.

GUY'S HOSPITAL, London, S.E.1. Applications are invited for the appointment of REGISTRAR (first year) to the Radiotherapy Department (whole-time). D.M.R. preferred but not essential. Duties to commence 1st January, 1956.

Forms of application are available from the Superintendent, Guy's Hospital London Bridge, S.E.1, and should be forwarded not later than 30th November, 1955.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications are invited for the 12 months appointment, now vacant, of SENIOR HOUSE OFFICER (obstetrics and gynæcology). Post recognised for M.R.C.O.G.

Apply Group Secretary, above address, by 23rd November, quoting HH/SHO/O.

HACKNEY GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the 12 months appointment of RESIDENT SENIOR HOUSE OFFICER (anæsthetics) now vacant. Duties shared between German Hospital (General—157 Beds) and the Mothers' Hospital (Salvation Army) (Maternity—110 Beds) with residence at German Hospital. The post offers experience in general surgical anæsthesia in the Group, and facilities are provided to study for higher examinations.

Apply, with testimonials, to Group Secretary, Hackney Hospital, London, E.9, quoting GMH/SHO.

HAMPSTEAD GENERAL HOSPITAL, Haverstock-hill, N.W.3. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered medical practitioners for the post of RESIDENT CASUALTY OFFICER (graded as Senior House Officer). Salary £745 p.a. Vacant 1st January, 1956, tenable for a period of 6 months at the Main Outpatients Department, Bayham-street, N.W.1.

Application forms may be obtained from the Secretary, to whom they should be returned, together with copies of 3 recent testimonials, by 24th November, 1955.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, London, N.21. ANÆSTHETIST (House Officer grade), resident, vacant 17th December. 100 active surgical and orthopædic beds, approximately 1200 operations annually.

Applications, with copies of 3 testimonials, to Hospital Secretary.

KING EDWARD MEMORIAL HOSPITAL, Ealing, W.13. SENIOR HOUSE OFFICER required 22nd December, 1955, for duty in Casualty, Orthopædic and Fracture Departments.

Applications, stating age, nationality, qualifications with dates, and details of experience, together with copies of 2 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 6th December, 1955.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from registered medical practitioners for the position of RESIDENT HOUSE SURGEON in Obstetric and Gynæcological Department. Appointment for 6 months from 1st January, 1956.

Application forms from the Physician-Superintendent. Stamped addressed envelope should be enclosed.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the post of RESIDENT HOUSE PHYSICIAN, vacant 1st January, 1956.

Application forms from the Physician-Superintendent. Stamped addressed envelope should be enclosed.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs for RESIDENT SURGICAL OFFICER appointment for 6 months with prospects of renewal. Post graded as Senior House Officer or Registrar according to qualifications and experience. Previous surgical experience necessary.

Applications, stating date of birth, qualifications with dates, and previous appointments held with copies of 3 testimonials, should be sent at once to THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER. Appointment for 1 year from 1st January, 1956, and graded as Registrar.

Applications, stating age, qualifications with dates, and previous appointments held with copies of 3 testimonials, should be sent to the undersigned not later than 23rd November, 1955. THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) HOUSE SURGEON (pre- or post-registration) required for 6 months commencing 2nd January, 1956.

Applications stating age, qualifications, experience, and copies of testimonials, to be sent to the Hospital Secretary.

ROYAL FREE HOSPITAL. Applications are invited for the posts of RESIDENT MEDICAL OFFICERS to work at the North Western Branch and the Liverpool Road Branch of the Royal Free Hospital. Terms and conditions of service in accordance with the Junior Hospital Medical Officer scale laid down by the Ministry of Health. Duties to commence on 1st February, 1956, for 6 months in the first instance.

Application forms may be obtained from the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 1st January, 1956.

MILE END HOSPITAL, Bancroft-road, E.1. (475 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (pre- or post-registration). Post vacant 18th December, 1955.

Application forms obtainable from the Physician-Superintendent, should be returned by 25th November, 1955, with copies of not more than 3 testimonials.

MILE END HOSPITAL, Bancroft-road, E.1. (Obstetric beds 60, Gynæcological beds 31.) Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant 28th December, 1955. Post recognised for M.R.C.O.G.

Application forms obtainable from the Physician-Superintendent to be returned by 25th November, 1955, with copies of not more than 3 testimonials.

MILE END HOSPITAL, Bancroft-road, E.1. Applications are invited for 2 posts of HOUSE SURGEON (second or third posts), obstetrics. Posts recognised in obstetrics for M.R.C.O.G. Vacancy (*a*) 21st December, 1955, (*b*) 16th February, 1956.

Application forms, obtainable from Physician-Superintendent, to be returned by 25th November, 1955, with copies of not more than 3 testimonials.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. HOUSE SURGEON (pre-registration—first or second post), resident, required for 1st January, 1956, for 6 months. General (including genito-urinary) surgery. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 29th November.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. CASUALTY OFFICER (Senior House Officer grade), 6 months appointment starting 20th December. Non-resident. Recognised for F.R.C.S. 4 Casualty Officers employed; duties include service with the 3 main surgical units.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials and or names of 2 referees, to Secretary of Hospital, by 29th November.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (248 Beds.) Applications are invited from qualified medical practitioners for appointment as RESIDENT JUNIOR HOUSE SURGEON for Casualty (pre-registration first or second post), for a period of 6 months, vacant 1st December, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee (Group 4), The Green, N.15, to be returned by 26th November, 1955.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, London, E.15. SENIOR CASUALTY OFFICER (Male or Female), Senior House Officer grade, for 12 months commencing 1st January, 1956. Post recognised for F.R.C.S. (i.e.—6 months as casualty and 6 months as general surgery).

Applications, with copies of 2 recent testimonials, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 26th November, 1955.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. (Lately Royal Cancer Hospital.) Applications are invited for the post of SURGICAL SENIOR REGISTRAR to begin duty immediately. The appointment will be for 3 or 4 sessions as arranged. The post is open only to candidates who hold Consultant or Senior Hospital Medical Officer sessions elsewhere, or have completed a period of training as Senior Registrars, or are from overseas and who wish to take a period of advanced training for not more than 2 years. Candidates must hold the Diploma of F.R.C.S.

Applications, quoting the names of 3 referees, should be submitted by 28th November, 1955, on a form which may be obtained from the House Governor.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3. (Lately Royal Cancer Hospital.) Applications are invited from registered medical practitioners for the 2 posts of HOUSE SURGEON (resident). Salary £525 a year. The posts are tenable for 6 months from 1st January and 11th February, 1956, respectively.

Applications, together with copies of 3 recent testimonials, should be submitted by 2nd December, 1955, on a form which may be obtained from the House Governor.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, BROCKLEY HILL, STANMORE, MIDDLESEX. Applications are invited for the posts of RESIDENT SENIOR HOUSE OFFICERS (2 vacancies), for a period of 6 months. 1 to commence duties on 13th February, 1956, and 1 on 17th February, 1956.

Applications to be received by 1st January, 1956. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer grade) with duties in the Radiotherapy Department, vacant 4th January, 1956. Post recognised for F.R.C.S.

Applications to be sent to the Hospital Secretary by 29th November, 1955.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. (279 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required in the Orthopædic and Fracture Department of the above Hospital. The department has a very large fracture clinic. Candidates may visit the Hospital by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Royal Northern Hospital, N.7, by 29th November, 1955.

ST. ANN'S GENERAL HOSPITAL, N.15. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON (third post) to above Hospital for a period of 6 months from 14th December, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned immediately.

ST. ANN'S GENERAL HOSPITAL, N.15. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON (Senior House Officer) to above Hospital for a period of 6 months from 14th December, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned immediately.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited for the post of HOUSE SURGEON to the Ophthalmic Department, post-registration, tenable for 6 months as from 1st January, 1956.

Applications, together with copies of 2 testimonials, should be submitted to the undersigned within 14 days.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (General—192 Beds.) Applications are invited from registered or provisionally registered practitioners for the post of HOUSE PHYSICIAN for 6 months commencing 15th December, 1955.

Applications, with 2 recent testimonials, to Hospital Secretary by 26th November, 1955.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (General—192 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (Casualty Officer), resident or non-resident. The appointment is for 12 months from 4th January, 1956.

Applications, with names of 2 referees, to the Hospital Secretary by 3rd December, 1955.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified registered practitioners for the post of RESIDENT ANÆSTHETIST. The appointment is for a first period of 6 months and the successful candidate will be required to take up his duties on 3rd January, 1956; remuneration to be at House Officer rates.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 7th December, 1955.

ST. MARY'S HOSPITAL, W.2. Applications are invited from suitably qualified practitioners for the posts of CASUALTY SURGEON (2 vacancies). Candidates must have held an appointment as House Surgeon at this Hospital or at another hospital approved by the Board of Governors. The appointments are for a first period of 6 months, with effect from 1st January, 1956. Remuneration at Senior House Officer rate.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 7th December, 1955.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. House PHYSICIAN for duty in Rheumatism Unit. Resident. This post offers valuable experience in general medicine and specialised experience in rheumatic and connective tissue diseases.

Applications, naming 2 referees, to the Medical Superintendent, not later than 30th November, 1955.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior MEDICAL CASUALTY OFFICER AND RESIDENT PATHOLOGIST (Senior House Officer grade), for a period of 6 months from 14th February, 1956.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 3rd December, 1955.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior SURGICAL CASUALTY OFFICER (House Officer grade), for a period of 6 months from 14th February, 1956. Resident.

Applications, from fully registered medical practitioners only, to the Clerk of the Governors by 3rd December, 1955, naming 2 referees.

ST. THOMAS'S HOSPITAL, London, S.E.1. House PHYSICIAN to the Children's Department, for a period of 6 months from 14th February, 1956. Resident.

Applications, from fully registered medical practitioners only, to the Clerk of the Governors by 3rd December, 1955, naming 2 referees.

ST. THOMAS'S HOSPITAL, London, S.E.1. House PHYSICIAN to the Departments of Neurology and Thoracic Medicine for a period of 6 months from 14th February, 1956. Resident.

Applications, from fully registered medical practitioners only, to the Clerk of the Governors by 3rd December, 1955, naming 2 referees.

ST. THOMAS'S HOSPITAL, London, S.E.1. House PHYSICIAN to the Department of Psychological Medicine, for a period of 6 months from 14th February, 1956. Resident.

Applications, from fully registered medical practitioners only, to the Clerk of the Governors by 3rd December, 1955, naming 2 referees.

ST. THOMAS'S HOSPITAL, London, S.E.1. House SURGEON (Thoracic Surgical Unit), for a period of 6 months from 14th February, 1956. Resident.

Applications, from fully registered medical practitioners only, to the Clerk of the Governors by 3rd December, 1955, naming 2 referees.

TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE, The Green, London, N.15. RESIDENT OBSTETRIC HOUSE OFFICERS (third post) required at Bearsted Memorial Hospital (Jewish Maternity Hospital) Lordship-road, N.16, and at The Green, Hampton Court, for 6-month posts commencing 1st January, 1956. Both posts recognised for the D.Obst. R.C.O.G. Previous obstetric experience an advantage.

Application forms from the Secretary, to be returned by 26th November, 1955.

SOUTH WESTERN HOSPITAL, Landor-road, S.W.9. HOUSE PHYSICIAN (registered or pre-registration) required at the above Hospital. Combined tuberculosis and acute medicine. Post vacant in January, 1956.

Form of application from the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11.

WANSTEAD HOSPITAL, Harmon Hill, E.11. (191 Beds.) Applications are invited for the post of CASUALTY OFFICER, recognised for F.R.C.S. Graded Senior House Officer. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

∞ Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (NO. 10) HOSPITAL GROUP. Applications are invited for the post of HOUSE PHYSICIAN (post-registration) in the Group Geriatric Unit at above Hospital.

Application forms from the Hospital Secretary to be returned by 5th December, 1955.

WHITTINGTON HOSPITAL, London, N.19. Applications are invited for the posts of :—

SENIOR HOUSE OFFICER (geriatrics).

HOUSE SURGEON (obstetrics). Post recognised for M.R.C.O.G. (Obstetrics).

*HOUSE PHYSICIAN (general medicine), 5 posts. Posts recognised for M.D. (Lond.).

†HOUSE SURGEON (general surgery), 3 posts. Posts recognised for F.R.C.S. (Eng.).

All posts vacant 1st January, 1956.

*Pre-registration candidates who have already held a first appointment are invited to apply for these posts.

†Pre-registration candidates are invited to apply for these posts.

Application forms obtainable from the Group Secretary, 46, Cholmeley-park, Highgate, London, N.6 (ARChway 3070, Ext. 24), and returnable to the Medical Superintendent, Whittington Hospital, London, N.19, by 28th November, 1955.

WHITTINGTON HOSPITAL, London N.19. Paediatric REGISTRAR required at above Hospital. Unit contains 58 Beds in addition to 64 neonatal cots. Post vacant 1st January, 1956. Hospital may be visited by appointment with the Medical Superintendent.

Application forms obtainable from, and returnable to, the Secretary, Archway Group Management Committee, 46, Cholmeley-park, Highgate, N.6, by 28th November, 1955.

WOOLWICH GROUP HOSPITAL MANAGEMENT COMMITTEE.

HOUSE SURGEONS (gynæcology and obstetrics), post-registration. 1 at St. Nicholas Hospital, Plumstead, S.E.18, vacant 1st January. Recognised for D.Obst.R.C.O.G. or 3 months gynæcology, 3 months obstetrics for M.R.C.O.G. 1 at Memorial Hospital, Woolwich, S.E.18, vacant mid-January. Recognised for M.R.C.O.G. (6 months gynæcology). Small Obstetric Unit providing good experience.

HOUSE PHYSICIANS. 4 posts vacant 1st January. 2 at St. Nicholas Hospital, Plumstead, 2 at Brook General Hospital, Woolwich. Recognised pre-registration posts. Closing date 25th November.

HOUSE SURGEONS. Recognised for F.R.C.S. and Pre-registration Service. 2 posts vacant 1st January at St. Nicholas Hospital, Plumstead. 2 posts vacant early January at Memorial Hospital, Woolwich.

Applications, stating post applied for, to be sent to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ALTON GENERAL HOSPITAL. (131 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT HOUSE PHYSICIAN (Senior House Officer grade) with some experience of anæsthetics. Useful experience to be obtained in general medicine. The appointment is for 6 months in first instance. Vacant mid-December.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to Group Secretary, Winchester Group of Hospitals, Royal Hampshire County Hospital, Winchester.

ALEXANDRIA, DUNBARTONSHIRE. VALE OF LEVEN HOSPITAL. Applications are invited for the following posts for the 6 months period commencing 1st February, 1956 :—

(1) RESIDENT HOUSE OFFICER in Medicine.

(2) RESIDENT HOUSE OFFICER in Surgery.

These posts are not recognised for pre-registration.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be forwarded to the Medical Superintendent, Vale of Leven Hospital, Alexandria, Dunbartonshire.

AYLESBURY, BUCKINGHAMSHIRE. ROYAL BUCK- INGHAMSHIRE HOSPITAL.

HOUSE SURGEON to Department of Obstetrics, Pre-registration Service post recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

HOUSE SURGEON to Department of Ophthalmology which is centred on this Hospital and conducts work at peripheral clinics. Post recognised for D.O.

HOUSE OFFICER to Accident and Orthopædic Department comprising 48 Beds. Duties also include some children's general surgery. Pre-registration Service post but registered practitioners are invited to apply. Post recognised for F.R.C.S.

All the above posts vacant mid-December.

Apply with 2 testimonials to the Secretary-Superintendent as soon as possible.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDE- VILLE HOSPITAL. HOUSE SURGEON for Gynæcology Department. Post recognised for M.R.C.O.G. Vacant 17th December, 1955.

Applications from registered practitioners, with 2 testimonials, to Administrative Officer as soon as possible.

AYLESBURY, BUCKINGHAMSHIRE. STOKE MANDE- VILLE HOSPITAL. SENIOR HOUSE OFFICER in the Rheumatism Research Centre with additional duties in the Area Department of Medicine.

Applications, with names of 2 referees, to the Administrative Officer.

BARNSLEY. BECKETT HOSPITAL. Senior House OFFICER (medical) required for the above Hospital. Post will be vacant 15th January, 1956.

Apply to Group Secretary, 33, Gawber-road, Barnsley.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON (pre-registration). Post vacant mid-January.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BEDFORD GENERAL HOSPITAL. (437 Beds.) Resident HOUSE SURGEON (gynæcology and obstetrics) required mid-December. Pre-registration post and recognised for D.Obst. R.C.O.G. The Unit comprises 26 gynæcological and 61 obstetric beds and a busy Outpatient Department.

Applications, stating age, nationality, qualifications, previous appointments, together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by not later than 21st November, 1955.

BEDFORD GENERAL HOSPITAL. (437 Beds.) Pre- registration HOUSE SURGEONS required (1 middle November and 3 end November). The appointments offer exceptional opportunities for general experience in busy acute Surgical Units.

Applications, stating age, nationality, qualifications, previous appointments (if any), together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Married accommodation available. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply to Group Secretary.

BIDEFORD AND DISTRICT HOSPITAL. (51 Beds.) Applications invited for the post of HOUSE OFFICER. Flat available for married officer.

Applications to Group Secretary, 19, Alexandra-road, Barnstaple, Devon.

BIRMINGHAM ACCIDENT HOSPITAL, Birmingham, 15. (215 Beds.) RESIDENT HOUSE SURGEONS, vacant December. Recognised for F.R.C.S. Appointment for 6 months in General Accident Service and (at applicant's request) includes period in 32-bedded Burns Unit.

Apply Administrator, naming 2 referees.

BIRMINGHAM. RUBERY HILL HOSPITAL. (950 Beds.) Applications invited for post of JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female), resident or non-resident. Valuable experience provided in the investigation, diagnosis and treatment of all forms of psychiatric illness. Previous postgraduate psychiatric experience not essential. Ministry of Health terms and conditions of service.

Applications, stating name, age, nationality, qualifications, experience, and providing the names of 3 referees, to be sent as soon as possible to the Group Secretary, Offices of the Group Hospital Management Committee, Rubery Hill Hospital, Birmingham.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Sanatoria) Group, Yardley Green Hospital, Birmingham, 9**

MEDICAL REGISTRAR (resident), Chest Diseases, including Tuberculosis, Romsley Hill Hospital (133 Beds, including Tuberculosis and a Diabetic Unit of 25 Beds), Birmingham Chest Clinic (4 notional half-days) and Asthma Clinic (1 notional half-day) for school children.

(2) **Birmingham (Selly Oak) Group, Oak Tree-lane, Birmingham, 29**

REGISTRAR (general surgery), resident. Duties at Solihull and Little Bromwich General Hospitals. Higher qualification desirable.

(3) **Mid-Worcestershire Group, Birmingham-road, Bromsgrove**

CASUALTY REGISTRAR, for Kidderminster and District General Hospital (112 Beds). Experience specialty essential. Higher qualification desirable. Resident/non-resident.

(4) **South Warwickshire Group, 50, Holly-walk, Leamington Spa**

REGISTRAR (general surgery), for Warwick Hospital (350 Beds). Experience specialty desirable. Higher qualification an advantage. Recognised for F.R.C.S.

(5) **Stoke-on-Trent Group, Princes-road, Stoke-on-Trent**

MEDICAL REGISTRAR for City General Hospital (resident). Higher qualifications desirable, but not essential. Duties in acute Medical Unit (150 Beds) and large Outpatient Department. Facilities for research, particularly in cardiology and respiratory diseases.

(6) **West Bromwich and District Group, Edward-street, West Bromwich**

REGISTRAR (general medicine) for Hallam Hospital (454 Beds). Resident. Experience specialty essential. Higher qualification desirable.

Application forms from the Group Secretaries, to be returned before 5th December, 1955. Candidates may visit hospitals.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (1055 Beds.) ASSISTANT CASUALTY OFFICER (Senior House Officer), resident/non-resident. Recognised for F.R.C.S.

Applications, giving qualifications, experience, and age, with copies of 3 recent testimonials, to Medical Superintendent.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) SENIOR HOUSE OFFICER required in Casualty Department (40,000 attendances per year). Resident or non-resident. Recognised for F.R.C.S. Tenable for 6 or 12 months.

Detailed applications, with copies of 3 testimonials, to Secretary.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. RESIDENT MEDICAL OFFICER (Senior House Office grade), vacant end December. General hospital with 5 other resident Medical Officers.

Applications, stating age, nationality, qualifications and experience, together with copies of testimonials or names for reference, to Medical Superintendent.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required 22nd November, 1955, for duties throughout Group, mainly at Royal Infirmary, Blackburn. Residence at Queen's Park Hospital, Blackburn. Post recognised for D.A. and F.F.A. R.C.S.

Apply to Secretary of Committee, with names of 2 referees or copies of testimonials, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pædiatrics) required 1st January, 1956. Post recognised for D.C.H. and duties, as laid down by Consultant Pædiatrician, at Queen's Park Hospital and Royal Infirmary, Blackburn, Victoria Hospital, Accrington (general hospitals) and Park Lee Hospital, Blackburn (I.D. Hospital).

Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN. ROYAL INFIRMARY. (262 general beds.) JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (casualty and orthopædics) required 11th December. Junior Hospital Medical Officer post can be for any period of up to 4 years and post recognised for F.R.C.S.

Apply to Secretary, Blackburn and District Hospital Management Committee, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKPOOL. VICTORIA HOSPITAL. (348 Beds.) RESIDENT HOUSE OFFICER (orthopædics and casualty). Applications are invited for this post vacant on 1st January next, which is recognised for the F.R.C.S. examination and for pre-registration purposes. This is a busy acute hospital serving the Fylde area.

Applications, stating age, qualifications, experience, together with the names and addresses of 2 referees, should be addressed to the Hospital Secretary.

BLACKPOOL. VICTORIA HOSPITAL. (348 Beds.) SENIOR HOUSE OFFICER (anæsthetics). Post recognised for the F.F.A.R.C.S. and D.A. This is a busy general hospital offering a sound and varied experience in anæsthetics.

Applications, giving age, qualifications, experience, and the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BLACKPOOL. VICTORIA HOSPITAL (348 Beds.) HOUSE OFFICERS (surgical). Appointments vacant mid and late January respectively. Pre-registration posts recognised for F.R.C.S. The Hospital is modern and serves the whole of the Fylde area.

Applications, stating age, qualifications, experience together with the names and addreses of 2 referees, should be sent to the Hospital Secretary.

BOLTON DISTRICT GENERAL HOSPITAL. (804 Beds.) RESIDENT HOUSE PHYSICIAN. Now vacant, tenable for 6 months and recognised under the Pre-registration Service Scheme.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BRIGHTON GENERAL HOSPITAL. House Surgeon (recognised for F.R.C.S.) to the General Surgical Unit (60 Beds). Post vacant on 11th December, 1955. Recognised as a pre-registration appointment.

Applications, stating age, qualifications, experience, and naming 2 referees, to the Physician-Superintendent, Brighton General Hospital, Elm Grove, Brighton, 7.

BRIGHTON GENERAL HOSPITAL. House Surgeon (orthopædics), vacant 28th December, 1955. Post is recognised as a pre-registration appointment.

Applications, stating age, qualifications and experience, with copies of recent testimonials, to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of GENERAL HOUSE SURGEON. The post, which becomes vacant on 20th December, 1955, is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Deputy Hospital Secretary at the Hospital.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of GENERAL HOUSE SURGEON, vacant 2nd December. The appointment is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Deputy Hospital Secretary at the Hospital.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON for general and thoracic surgery, vacant 3rd December, 1955. The appointment is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Deputy Hospital Secretary at the Hospital.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN vacant immediately. The appointment is recognised for pre-registration purposes.

Applications to the Deputy Hospital Secretary at the Hospital.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (anæsthetics) required for post vacant on 24th November. The post, which is recognised for the D.A. and F.F.A.R.C.S., is tenable for 12 months. Experience with Thoracic Unit available.

Applications to the Deputy Hospital Secretary.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HANTS. 2 HOUSE PHYSICIANS (pre-registration interns) required for general medicine for posts becoming vacant on 21st and 27th December, respectively, at the above Hospital of 289 Beds (including 80 acute medical, 34 pædiatric, 6 chest diagnostic and 169 chronic).

Applications, with copies of testimonials, to the Group Secretary, Bournemouth and East Dorset Hospital Management Committee, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth.

BRISTOL. COSSHAM FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (513 staffed Beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the Regional Neurosurgery Department, vacant mid-December. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis. Recognised for F.R.C.S.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (423 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON at the above Hospital. Post vacant January, 1956.

Applications, with the names of 3 referees, to the Hospital Secretary.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (423 Beds.) HOUSE PHYSICIAN (pre-registration) required at the above Hospital. Post vacant January, 1956.

Applications, with the names of 3 referees, to the Hospital Secretary.

BROMSGROVE, WORCESTERSHIRE. HILL TOP HOSPITAL. REGIONAL THORACIC SURGICAL CENTRE. HOUSE PHYSICIAN required at the above Hospital. Post vacant in December.

Applications, with the names of 3 referees, to the Hospital Secretary.

BROMSGROVE, WORCESTERSHIRE. BARNSLEY HALL HOSPITAL FOR MENTAL AND NERVOUS DISEASES. (750 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER. Accommodation available for single man. Remuneration will be in accordance with the terms and conditions of service issued by the Ministry of Health. Extensive psychiatric outpatient services.

Applications, stating age and experience, together with the names of 3 referees, to the Medical Superintendent.

BURTON-ON-TRENT GENERAL HOSPITAL. Orthopædic HOUSE SURGEON required. Applications for short-time LOCUM appointment considered.

Apply Group Secretary.

BURY ST. EDMUNDS. WEST SUFFOLK GENERAL HOSPITAL. (285 Beds.) Applications invited for the following posts :—

(*a*) JUNIOR HOSPITAL MEDICAL OFFICER for casualty duties. Vacant mid-January.
(*b*) HOUSE SURGEON for general and other duties. Vacant mid-November.
(*c*) HOUSE SURGEON for general surgical duties. Recognised for F.R.C.S. Vacant mid-January.

Posts (*b*) and (*c*) are recognised for pre-registration.

Inquiries and applications to Hospital Secretary.

CHELMSFORD. ST. JOHN'S HOSPITAL. House SURGEON (pre-registration first, second or third post). Duties commencing 2nd December, 1955. The Hospital deals with a large number of routine and emergency cases. The post is recognised for training for the F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, should be received not later than 22nd November by the Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CAMBRIDGE. FULBOURN HOSPITAL. Senior House OFFICER (resident or non-resident). Previous psychiatric experience not required. This Hospital of 966 Beds is linked with the Cambridge University Department of Psychology and Addenbrooke's Hospital, and provides a basic psychiatric training leading to the D.P.M.

Applications, stating age, qualifications and experience with names of 2 referees, should be sent to—

Dr. D. H. CLARK, Medical Superintendent.
Fulbourn Hospital, near Cambridge.

CARLISLE. GARLANDS HOSPITAL. (1060 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Mental Hospital. Non-resident post. Salary scale £775–£50–£1075 p.a.

Applications to the Medical Superintendent stating age, qualifications, experience, and names and addresses of 2 referees.

CHELTENHAM GENERAL AND EYE HOSPITAL. (170 Beds.) HOUSE SURGEONS (pre-registration or otherwise) required, 1 for early December, and 1 for early January, 1956.

Applications, together with the names of 2 referees, to be sent to the Group Secretary, General Hospital, Cheltenham.

CHELTENHAM GENERAL AND EYE HOSPITAL. (170 Beds.) RESIDENT SENIOR HOUSE OFFICER (casualty) required at beginning of March, 1956.

Applications, giving details of qualifications and experience, and names of 3 referees, to be sent to the Group Secretary, General Hospital, Sandford-road, Cheltenham.

CHELTENHAM MATERNITY HOSPITAL. Cheltenham GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of RESIDENT OBSTETRIC OFFICER. The Hospital, which is recognised for the purpose of training for the D.Obst.R.C.O.G., has 50 Beds and deals with the majority of abnormal midwifery cases in North Gloucestershire. The appointment is for a period of 6 months and the salary will be £425, £475, or £525 p.a., less £125 in respect of residential emoluments. The appointment will be vacant in early January, 1956.

Applications, stating age, qualifications, and experience, and accompanied by copies of 3 recent testimonials, should be sent to the Secretary, Cheltenham Group Hospital Management Committee, General Hospital, Cheltenham.

CANTERBURY (near). ST. AUGUSTINE'S HOSPITAL, CHARTHAM, near CANTERBURY. JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female) required at this Mental Hospital. Salary scale £775–£1075 p.a. A modern house is available on the Hospital estate for a married man at reasonable charge. The post offers experience in all branches of psychiatry, including all forms of modern treatment and outpatients clinics. The Hospital has a high admission-rate and is recognised for the D.P.M.

Apply to the Physician-Superintendent.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of GENERAL SURGICAL AND ORTHOPÆDIC HOUSE SURGEON, which is recognised for the F.R.C.S. Diploma, becomes vacant early in December, 1955. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARSHALTON. QUEEN MARY'S HOSPITAL FOR CHILDREN. (General Children's Hospital of 818 Beds.) REGISTRAR required for medical duties. Applicants are invited to visit the Hospital (which is within easy reach of central London) by appointment.

Applications on forms obtainable from the Group Secretary, should be returned by 10th December, 1955.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL, (404 Beds.) CLINICAL ASSISTANT (General Practitioner status) or part-time REGISTRAR required for 3 half-day sessions per week in Dermatological Department.

Apply, with names of 2 referees, to Secretary, Woking and Chertsey Hospital Management Committee, "Huntington," Chertsey, Surrey.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Post recognised for F.R.C.S. 7 residents including Resident Surgical Officer and 3 House Surgeons. Vacant from 15th December, 1955.

Apply to Senior Administrative Officer.

CHICHESTER. ST. RICHARD'S HOSPITAL. (400 Beds.) CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Required :—

(1) 2 HOUSE SURGEONS (pre-registration) for 6 months only in the first instance. Posts vacant 1st January, 1956. The man or woman appointed will work primarily in the surgical wards of the Hospital. Hospital recognised for F.R.C.S.

(2) SENIOR HOUSE OFFICER to the General Medical and Medical and Surgical Chest Units. Post becomes vacant on 1st January, 1956.

Applications, stating age, qualifications, experience and giving names of 2 persons to whom reference may be made, should be sent to the Surgeon-Superintendent.

CHICHESTER GROUP OF HOSPITALS. Resident ANÆSTHETIST SENIOR HOUSE OFFICER required for 6 months from 1st February, 1956. Recognised for F.F.A.R.C.S. Group post. Work mainly at Royal West Sussex, St. Richard's and Bognor Hospitals. Salary £745, less £165 p.a. for residence.

Applications, with 2 referees names, to Group Secretary, 174, Broyle-road, Chichester.

DUNFERMLINE AND WEST FIFE HOSPITAL, Reid-street, DUNFERMLINE. (General Surgery—117 Beds.) Applications are invited for appointment as HOUSE SURGEON (Male or Female), qualified or undertaking Pre-registration Service. Resident. Salary and conditions of service in accordance with National Health Service Whitley Council agreements. Post superannuable.

Apply to the Surgeon-Superintendent.

DOVERCOURT. HARWICH AND DISTRICT HOS-PITAL. (30 Beds.) Applications invited for post of SENIOR HOUSE OFFICER. Duties mainly surgical, but there is a proportion of medical beds. In addition there is surgical, medical, E.N.T. outpatient and casualty work. Post tenable for 1 year.

Applications, with copies of 3 testimonials, to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology, Peterborough Group of hospitals. Unit consists of 73 obstetric beds and a busy Gynæcological Department. Recognised for M.R.C.O.G. in obstetrics. Appointment for 1 year, renewable for second year.

Applications, stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 5th December, 1955. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary at the Hospital.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Corbett Hospital, Stourbridge (106 Beds)

HOUSE OFFICER (surgical), pre-registration. Post vacant December.

HOUSE OFFICER (medical), pre-registration. Post vacant December.

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (anæsthetics). Post now vacant.

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley, Worcs.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House PHYSICIAN (pre-registration), vacant 1st January, 1956.

Apply, giving full particulars, together with copies of 2 testimonials, to Hospital Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. House SURGEON (pre-registration), vacant 1st January, 1956.

Apply, giving full particulars, together with copies of 2 testimonials, to Hospital Secretary.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT SENIOR CASUALTY HOUSE OFFICER required at above Hospital. Post vacant January, 1956. Salary £745 p.a. Deduction of £155 p.a. for board-residence, &c.

Apply immediately, stating age, nationality, qualifications, and experience, together with the names and addresses of 2 referees, to Group Secretary, Edgware General Hospital.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) 2 RESIDENT HOUSE PHYSICIANS for above Hospital. Posts vacant 29th December, 1955, and 4th January, 1956. 6 months appointments. Posts recognised for pre-registration purposes.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 26th November, 1955.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE SURGEON (approved pre-registration), vacant 26th January, 1956. Duties with a general Surgical Unit doing some orthopædic work. Post recognised by the Royal College of Surgeons, 6 months appointment.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee.

EPPING CHEST CLINIC. Assistant Chest Physician (4 sessions weekly) for above Clinic situated at St. Margaret's Hospital, Epping. Previous experience in chest diseases essential. Salary at the rate of £700 p.a.

Applications, with names of 2 referees, to reach the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 26th November, 1955.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) HOUSE SURGEON (pre-registration post), General and E.N.T. Surgery.

HOUSE PHYSICIAN (pre-registration post).

Both posts vacant 1st January, 1956. Busy general hospital with easy access to London.

Applications, with copies of testimonials, including 1 from medical school, to reach the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, by 26th November, 1955.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required for Orthopædic, E.N.T., and Eye Departments, vacancy 6th December. Pre-registration post.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, should be sent immediately to Group Secretary at above address.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 6th December. Pre-registration post. Recognised for F.R.C.S.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, should be sent immediately to Group Secretary, at above address.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (232 Beds.) CASUALTY OFFICER required. The post is recognised for the F.R.C.S. examination and the grading is that of Senior House Officer. 2 Casualty Officers are employed who share the work of the department which is part of the Orthopædic and Traumatic Unit. Regular instruction is given in traumatic surgery and Casualty Officers take part in the work of fracture clinics. Post is vacant on 2nd January, 1956.

Applications, with copies of testimonials, to the Hospital Secretary.

GODALMING. MILFORD CHEST HOSPITAL. Locum SENIOR THORACIC REGISTRAR. A vacancy exists at the above busy Chest Hospital for this post from 19th February to 17th March, 1956. Salary £24 per week.

Applications to the Physician-Superintendent, Milford Chest Hospital, Godalming, Surrey.

GLASGOW. ROYAL HOSPITAL FOR SICK CHILDREN, YORKHILL, GLASGOW, C.3. Applications are invited for posts as RESIDENT HOUSE PHYSICIAN at the above Hospital, for the term February–August, 1956. These posts are recognised for pre-registration.

Applications should be addressed to the Medical Superintendent.

GLASGOW. ROYAL HOSPITAL FOR SICK CHILDREN, YORKHILL, GLASGOW, C.3. Applications are invited for posts as RESIDENT HOUSE SURGEON at the above Hospital, for the term February–August, 1956. These posts are recognised for pre-registration.

Applications should be addressed to the Medical Superintendent.

GLASGOW, S.W.1. SOUTHERN GENERAL HOSPITAL, SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required immediately for 6-8 weeks locum duty.

Write immediately to Medical Superintendent, naming 2 referees.

GREENOCK. RAVENSCRAIG (MENTAL AND GENERAL) HOSPITAL. (472 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER (resident post). Mental and general experience to be gained. Hospital is recognised as a training centre for the D.P.M. examination.

Applications, in writing, to the Physician-Superintendent as soon as possible.

HALIFAX GENERAL HOSPITAL. (425 Beds.) House PHYSICIAN required for Pædiatric Unit of 35 Beds. Approved pre-registration appointment and recognised for D.C.H. Post vacant 1st January.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

HAREFIELD HOSPITAL REGIONAL THORACIC SUR-GICAL UNIT, HAREFIELD, MIDDLESEX. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the post of REGISTRAR to the Harefield Thoracic Surgical Unit which serves the North West Metropolitan Region. In the Hospital there are 90 Beds for non-tuberculous chest conditions and 446 Beds for tuberculosis. The appointment thus affords a wide experience in all branches of thoracic surgery. Candidates must have had previous surgical experience and preference will be given to candidates with a higher surgical qualification. The appointment will be held in the first instance for 1 year.

Application forms obtainable from, and returnable to, the Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 6th December, 1955.

HASTINGS AND ST. LEONARDS. BUCHANAN HOS-PITAL. (94 Beds.) SENIOR HOUSE OFFICER required for urology and children's surgery. Post, vacant end of December, 1955, is recognised for F.R.C.S., and may be tenable for 6 or 12 months. National scale of salary. Married quarters to be available if required.

Apply to Hospital Administrator giving names of 3 referees.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general—first, second, or third post). To commence 23rd December, 1955. Pre-registration post. Recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of RESIDENT HOUSE PHYSICIAN (Male or Female), second post held. Recognised pre-registration post. 6 months appointment. Preference given to applicants who have held resident surgical or medical posts in general hospital. Duties to commence 28th December, 1955.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HEXHAM GENERAL HOSPITAL. (309 Beds.) The following pre-registration posts will become vacant on 7th January, 1956, viz. :—

HOUSE OFFICERS (2) (general surgery).
HOUSE OFFICER (general medicine).
HOUSE OFFICER (orthopædics).

The Hospital is recognised by the Royal College of Surgeons, 1 of the posts in general surgery and that in orthopædics could be rotating for 3 months each.

Applications, with the names and addresses of 2 referees, to be received by the undersigned as early as possible.

W. STOKELL, Group Secretary,
Hexham and District Hospital Management Committee.
General Hospital, Hexham, Northumberland.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required for Pædiatric Department commencing 27th December, 1955, for 6 months. 3 months will be spent at the Victoria Children's Hospital and 3 months at the Western General Hospital (special baby unit). Recognised for D.C.H.

Applications, stating experience, references, &c., before 30th November, to the Hospital Secretary at the above address.

HITCHIN HOSPITALS, Hitchin, Hertfordshire. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer), vacant 1st January, 1956. The post offers varied experience, and is recognised for the D.A. and F.F.A.R.C.S. examinations.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital, Hitchin, as soon as possible.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON, vacant 1st January, 1956. Recognised as pre-registration post and for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator as soon as possible.

HITCHIN, HERTFORDSHIRE. NORTH HERTS HOS-PITAL. RESIDENT HOUSE SURGEON in Obstetrics and Gynæcology required for 6 months from 1st January, 1956. Duties include the maternity wards (42 Beds) and gynæcological ward (20 Beds). The post is recognised for the D.Obst.R.C.O.G.

Applications, stating age, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital, Hitchin, as soon as possible.

HITCHIN, HERTFORDSHIRE. NORTH HERTS HOS-PITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON, vacant 25th November, 1955. Recognised as pre-registration post and for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital, Hitchin, as soon as possible.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. (170 Beds.) HOUSE PHYSICIAN (pre-registration) required. Post vacant 1st December, 1955.

Applications, giving full details and names of 2 referees, should be sent to the Hospital Secretary.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (General Acute—81 Beds.) Applications are invited for the appointment of RESIDENT HOUSE SURGEON. Recognised pre-registration appointment for 6 months. Vacant 22nd November, 1955.

Applications, stating qualifications and age, together with copies of up to 3 recent testimonials, or names for reference, to the Hospital Secretary.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE PHYSICIAN to commence duties on 15th December, 1955. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical), now vacant. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Group Secretary, Hospital Management Committee Offices, Newmarket General Hospital, Newmarket.

ILFORD. KING GEORGE HOSPITAL. (General Hos-pital—211 Beds.) There will be a vacancy for a SENIOR HOUSE OFFICER (Orthopædic Department) at above Hospital on 12th December, 1955. Salary will be at the rate of £745 p.a., less emoluments. Recognised for F.R.C.S.

Applicants should have been registered not less than 1 year and should send applications, accompanied by copies of 3 testimonials, to the undersigned within 7 days of the appearance of this advertisement. H. F. HARRIS, Group Secretary, Ilford and Barking Group Hospital Management Committee.

IPSWICH AND EAST SUFFOLK HOSPITAL. Heath ROAD WING, IPSWICH. (270 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Fracture and Orthopædic Department). The post is normally of 1 years duration. It is recognised as part of the necessary surgical experience for the Final F.R.C.S.

Applications, stating age, qualifications, and experience, together with recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Heath ROAD WING, IPSWICH. (270 Beds.) Applications are invited for the post of PÆDIATRIC HOUSE PHYSICIAN (Senior House Officer grade) which becomes vacant at the Hospital on 27th December, 1955. The post is recognised for the D.C.H.

Applications, stating age, nationality, and previous experience, together with 3 names of referees or 3 recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of SENIOR HOUSE SURGEON to the Fracture and Orthopædic Department. The post is graded Senior House Officer and is recognised for the F.R.C.S. examinations. The Department has 2 Consultants, about 60 Beds and a large outpatient attendance ; it offers wide experience.

Applications, stating age, nationality and experience, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Fracture and Orthopædic Department. Approved pre-registration post.

Applications, with copies of recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the Senior General Consulting Surgeon. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

KIDDERMINSTER AND DISTRICT GENERAL HOS-PITAL, WORCS. (112 Beds.) HOUSE PHYSICIAN (pre-registration) required at the above Hospital. Post vacant January, 1956.

Applications to the Hospital Secretary.

KIDDERMINSTER AND DISTRICT GENERAL HOS-PITAL, WORCS. (112 Beds.) Applications are invited for the pre-registration posts of 2 HOUSE SURGEONS at the above Hospital. Posts now vacant.

Applications, with the names of 3 referees, to the Hospital Secretary.

LEEDS. THE UNITED LEEDS HOSPITALS. Senior HOUSE OFFICER in General Medicine required for duties as Resident Medical Officer at the annexe (117 Beds) of the General Infirmary at Leeds. The post may entail some duties at the Infirmary. Terms and conditions of service for hospital medical and dental staffs apply.

Applications, giving age, qualifications, previous posts with dates, and 3 names for reference, should be sent to the Secretary to the Board.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. SENIOR REGISTRAR in Diagnostic Radiology required for 1 year in the first instance; appointment renewable thereafter. Diploma in Radiology essential and other higher qualification desirable. Terms and conditions of service for hospital medical staff apply.

Applications, giving details of age, education, qualifications, and previous posts with dates, and 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 2, before 26th November.

LEEDS. THE UNITED LEEDS HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER to the Professorial Department of Psychiatry attached to this teaching hospital. The post is non-resident and will be of 1 years duration.

Applications, stating age, qualifications, and previous posts with dates, and 3 names for reference, should be forwarded to the Secretary to the Board, General Infirmary at Leeds, not later than 26th November, 1955.

LEEDS. THE UNITED LEEDS HOSPITALS. Registrar in Anæsthetics required for duties in the Teaching Hospital Group, commencing 1st January, 1956. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, experience (with relevant dates), and giving 3 names for reference, should be forwarded to the Sub-Dean, the Medical School, Leeds, 2, not later than 26th November, 1955.

LEEDS. UNITED LEEDS HOSPITALS. Applications are invited for the post of ASSISTANT RESIDENT MEDICAL OFFICER at the General Infirmary at Leeds. The post is in the Registrar grade and will be for 1 year in the first instance from 1st January, 1956. Terms and conditions of service of hospital medical staff apply.

Applications, stating age, qualifications, and previous posts with dates, are to be forwarded not later than 30th November, 1955, to the Sub-Dean, School of Medicine, Leeds, 2.

LANCASTER. ROYAL ALBERT HOSPITAL MANAGEMENT COMMITTEE. The Committee invite applications for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident, Male) at the Royal Albert Hospital for Mental Defectives (920 Beds). Salary £775–£50–£1075. Small cottage available for a married officer at a net weekly rent of 10s. 3d. The appointment will be limited to 4 years duration, and will be subject to National Health Service superannuation regulations and conditions of service.

Application forms obtainable from the Medical Superintendent to be submitted by Saturday, 3rd December, 1955.

LEICESTER ROYAL INFIRMARY. Applications are invited for the post of HOUSE SURGEON, available for pre-registration candidates, vacant 1st January. Recognised for F.R.C.S.

Applications, stating age and qualifications, with copies of recent testimonials, to the Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary, by 23rd November.

LEWES (near) CHAILEY HERITAGE (Craft School and HOSPITAL), NORTH COMMON, CHAILEY, near LEWES, SUSSEX. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOUSE OFFICER appointment for 6 months in 300-bedded Children's long-stay Orthopædic Hospital and Hospital School. Useful experience in orthopædics and pædiatrics, and for candidate working for D.C.H. or contemplating School Medical Service. Preferably should have held a previous appointment. Terms and conditions applicable under National Health Service.

Applications, with 2 references or recent testimonials, to Medical Administrator, at above address.

LIVERPOOL, 22. WATERLOO HOSPITAL. A vacancy occurs for a RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) at this small general hospital. The post is offered in the first instance for 1 year with opportunity to continue.

Apply to Secretary, Walton Hospital, Liverpool, 9, stating age, experience and qualifications and giving names of 2 referees.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of SENIOR HOUSE OFFICER in Orthopædics for the period to 30th September, 1956.

Apply as soon as possible on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LUTON AND DUNSTABLE HOSPITAL (250 Beds) and associated units (134 Beds). NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident) required at above Hospital. Post vacant 24th January, 1956, and recognised for D.A. The Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds., by 6th December, 1955.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the Ophthalmic Department of the above Hospital. The Hospital is recognised by the Examining Boards for the F.R.C.S. and the D.O. Appointment will be for 12 months. Salary £745 a year, less £150 a year for residential emoluments.

Applications should be forwarded as soon as possible to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Church-street, Maidstone.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. Salary £745 a year, less £150 a year for board and lodging.

Applications to the Administrative Officer at the Hospital as soon as possible.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (197 Beds.) CASUALTY OFFICER (Senior House Officer) Male or Female, resident or non-resident. Post vacant 27th December and suitable for one reading for higher qualifications, being recognised for F.R.C.S., affording contact with all Specialist Units in the Hospital.

Applications, with names and addresses of 3 referees, to Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (197 Beds.) RESIDENT HOUSE SURGEON (general surgery). Post vacant 6th December, 1955. Recognised for pre-registration and F.R.C.S. Post provides excellent experience. Good accommodation available.

Apply Hospital Secretary.

MARGATE. ROYAL SEA BATHING HOSPITAL. (Surgical, Tuberculosis and Orthopædics—241 Beds.) SENIOR HOUSE OFFICER. This post (1 of 2), now vacant, is largely an orthopædic one, and affords experience in the treatment of tuberculous and non-tuberculous orthopædic conditions. There is also a Genito-urinary Unit of 35 Beds and a small number of beds for other tuberculous conditions. The post is suitable for someone reading for a higher surgical examination. Salary £745 p.a., less £150 for residential emoluments.

Applications, with copies of testimonials, to be sent to the Hospital Secretary.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR REGISTRARS :—

(*a*) Pathology—joint appointment with Board of Governors of United Manchester Hospitals—main duties initially at Manchester Royal Infirmary. Facilities for training in all branches of pathology will be provided in both teaching and non-teaching hospitals in the Manchester area. 28th November, 1955.

(*b*) Radiology (2 posts)—5th December, 1955.

(i) Joint appointment with Board of Governors of United Manchester Hospitals, with duties at Manchester Royal Infirmary, &c., and Christie Hospital and Holt Radium Institute, Manchester.

(ii) South Manchester Group of hospitals, mainly at Withington Hospital.

(*c*) Orthopædic Surgery—Salford Group of hospitals, with main duties at Salford Royal Hospital. 5th December, 1955.

(*d*) General Surgery—South Manchester Group of hospitals, with main duties at Withington Hospital (1000 Beds approximately). 5th December, 1955.

(*e*) Radiotherapy—at the Christie Hospital and Holt Radium Institute, Manchester. D.M.R.T. essential, F.F.R. desirable. 5th December, 1955.

Arrangements may later be made for appointees to posts (*b*) (ii), (*c*) and (*d*) to transfer to the United Manchester Hospitals (Manchester Royal Infirmary) for further experience and training.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by dates stated.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Anæsthetics (resident or non-resident), vacant 1st February, 1956, to the Macclesfield and District Group of hospitals, with main duties at the Infirmary Branch of the Macclesfield Hospital. The Hospital is recognised for the purpose of the F.F.A.R.C.S. and D.A. Excellent facilities for study. A resident Anæsthetic Senior House Officer is also employed.

Forms of application may be obtained from the Secretary of the Hospital Management Committee, "Willerby House," Cumberland-street, Macclesfield, and should be returned with names of 2 referees to be received as soon as possible.

MANCHESTER, 23. WYTHENSHAWE HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade) at the above Hospital.

Applications, stating age, qualifications, present post, experience, and names of 2 referees, to be forwarded immediately to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER, 23. WYTHENSHAWE HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (plastic surgery) with 3 sessions per week in general surgery at the above Hospital which is a General Hospital with 75 plastic surgery beds. Post vacant immediately.

Applications, with full details, to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of OBSTETRICAL HOUSE SURGEON to a Maternity Unit operating temporarily in the Whitworth Park Branch of the above-named Hospital, vacant 1st February, 1956. The post is supernumerary to the establishment recognised for training purposes by the Royal College of Obstetricians and Gynæcologists. Previous obstetrical experience is desirable. An opportunity exists for a limited amount of gynæcological training during tenure of the post. National scale.

Application forms, which may be obtained from the undersigned, to be returned not later than 30th November, 1955.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for 3 posts of HOUSE OFFICER in Obstetrics, 2 of which are for provisionally registered medical practitioners. Salary in accordance with National scale. The appointments are for 6 months from 1st February, 1956.

Application forms may be obtained from the undersigned and returned not later than 30th November, 1955.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. UNIVERSITY DEPARTMENT OF OPHTHALMOLOGY. Applications are invited for the post of REGISTRAR at the above Hospital (attached to the University Department of Ophthalmology). Whole-time post (non-resident). Tenable for 12 months, subject to renewal. Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications to be made as soon as possible on forms obtainable from the undersigned.

H. R. NORTH, General Superintendent.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited from registered medical practitioners, Male or Female, for the post of HOUSE PHYSICIAN in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health) for a period of 6 months, vacant on 1st February, 1956. Previous hospital experience essential and paediatric experience desirable. Duties include the care of the newborn in the Maternity Department, the care of infants in the infants' ward and work in the clinics under the charge of the Department of Child Health. Salary in accordance with national scale.

Applications, stating qualifications and experience, together with the names of 3 referees, should be sent to the undersigned not later than 30th November, 1955.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. SPRINGFIELD HOSPITAL, Crumpsall, MANCHESTER, 8. SPRINGFIELD AND SWINTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at this Mental Hospital of over 750 Beds. Period of tenure, 4 years in the first instance. Modern methods of investigation and treatment are carried out. Facilities will be granted for attendance at the Course for D.P.M. of the University of Manchester (with the Department of Psychiatry of which this Hospital is associated). Preference given to candidates who have previous general hospital and/or psychiatric experience. Accommodation is available for a single person. Terms and conditions of the National Health Service apply. Further particulars can be obtained from, and the Hospital may be visited by arrangement with, the Medical Superintendent.

Applications, giving details of age, experience, &c., and the names of 3 referees, to the Medical Superintendent as soon as possible.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) 1 SENIOR HOUSE OFFICER (general medicine), required. Post vacant end December.

Application forms from Secretary.

NEWMARKET GENERAL HOSPITAL, Suffolk. Applications are invited for the post of HOUSE PHYSICIAN, vacant 21st January, 1956. Duties include house charge of general medical and pulmonary tuberculosis beds. The post is recognised for pre-registration, is resident and tenable for 6 months. Salary in accordance with national scale.

Applications, together with 3 recent testimonials, to Medical Superintendent.

NEWMARKET GENERAL HOSPITAL, Suffolk. Applications are invited for the post of HOUSE SURGEON, vacant 23rd December, 1955. Duties include surgical house charge of general surgical, E.N.T., and eye cases. Post resident and available for 6 months, recognised for pre-registration.

Applications, with copies of 3 testimonials, to the Medical Superintendent.

NEWMARKET GENERAL HOSPITAL, Suffolk. Applications are invited for the post of SENIOR HOUSE OFFICER, obstetrics (14 Beds) and gynæcology (10 Beds), with opportunity for gaining experience in general surgery. Vacant 15th January, 1956. Salary £745, less emoluments.

Applications, giving age, nationality and qualifications, together with copies of 3 recent testimonials, to be addressed to the Medical Superintendent.

NEWTON ABBOT HOSPITAL, South Devonshire. Senior HOUSE OFFICER (medicine), Male or Female, required early December. Duties divided equally between 20 acute medical beds in general section and 140 geriatric beds. This officer is also required to stand in when Senior House Surgeon otherwise engaged. Married quarters available.

Applications, stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE SURGEON for general surgery and urology, vacant 1st December, 1955. Recognised for the Final F.R.C.S. in General Surgery, and recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, to be forwarded to the Resident Medical Officer by 22nd November, 1955.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN to the Radiotherapy Department, vacant 1st December, 1955. This post is recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, to be forwarded to the Resident Medical Officer by 22nd November, 1955.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL AND RADIUM INSTITUTE. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required for Department of Pathology at above Hospital.

Application forms obtainable from, and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 29th November, 1955.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. The following posts become vacant on 7th January, 1956. Undergraduate teaching is conducted in most departments of the Hospital.

*HOUSE PHYSICIANS (4), general medical wards (2 of these posts rotate with the House Physician post in the Cardiovascular Department).

*HOUSE PHYSICIAN (1), Cardiovascular Department (this post rotates with 2 House Physician posts in general medicine).

*HOUSE PHYSICIANS (2), Paediatrics. This department is actively associated with the Department of Child Health of Durham University, and the post offers good opportunities for gaining experience in paediatrics.

*HOUSE PHYSICIAN (1), Geriatric Unit.

*HOUSE SURGEONS (2), General Surgery (recognised for the F.R.C.S. Diploma).

*HOUSE SURGEON (1), Accident and Admission Department (recognised for F.R.C.S. Diploma).

*These posts are recognised for the purpose of Pre-registration Service and applications will be accepted from students on the point of taking their qualifying examinations.

Applications, together with 1 copy of 2 recent testimonials, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, by 11th December, 1955.

NEWCASTLE REGIONAL HOSPITAL BOARD. East CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. SENIOR REGISTRAR ANÆSTHETIST (whole-time). Mainly at Cumberland Infirmary, Carlisle.

Applications, with names and addresses of 3 referees, to the Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Special AREA COMMITTEE FOR CUMBERLAND AND NORTH WESTMORLAND. ORTHOPÆDIC REGISTRAR. Cumberland Infirmary, Carlisle (340 Beds). Appointment for 1 year with likelihood of extension for second year. Residence provided for single Doctor, if required.

Applications, with names of up to 3 referees, to Senior Administrative Medical Officer, 72, Warwick-road, Carlisle, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD.

Hartlepools Hospital Management Committee

REGISTRAR PATHOLOGIST (whole-time), non-resident. Unfurnished flat available. Applications will be considered from doctors who do not necessarily intend to specialise in pathology but desire pathological experience for 1 or 2 years. The Central Laboratory, General Hospital, West Hartlepool, is in a new building and this appointment offers good experience in pathology as applied to the clinical specialties and to general practice.

Darlington Hospital Management Committee

REGISTRAR SURGEON (whole-time) at Darlington Memorial Hospital. Single accommodation available. Post recognised for F.R.C.S.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6. within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Sunderland AREA HOSPITAL MANAGEMENT COMMITTEE. (Population 357,699.) SENIOR REGISTRAR PATHOLOGIST (whole-time), servicing 2047 Beds, plus Cherry Knowle Mental Hospital 843 Beds. Good facilities offered for experience in all branches of clinical pathology.

Applications, with names and addresses of 3 referees, to the Senior Administrative Medical Officer, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE AND HEXHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. DEPARTMENTS OF OBSTETRICS AND GYNÆCOLOGY. Applications are invited for the following posts vacant on 7th January, 1956 :—

(1) **Newcastle General Hospital** (838 Beds)

(*a*) Department of Obstetrics (70 Beds) : HOUSE SURGEON (resident), pre-registration.

(*b*) Department of Gynæcology (30 Beds) : HOUSE SURGEON (resident), pre-registration.

This department is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G., and undertakes the training of medical students in the University of Durham. Preference will be given to provisionally registered candidates who have carried out their first house appointment. Consideration may be given to the possibility of alternating these posts.

(2) **Hexham General Hospital** (314 Beds)

Gynæcology : HOUSE SURGEON (resident), pre-registration. Recognised for M.R.C.O.G. Applications considered from final year students in anticipation of graduation.

(3) **Dilston Hall Maternity Hospital, Corbridge** (50 Beds)

Obstetrics : HOUSE SURGEON (resident), pre-registration. Recognised for D.Obst.R.C.O.G.

Applications, together with 1 copy of 2 recent testimonials, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, by 11th December. 1955.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Applications are invited for the post of OBSTETRIC HOUSE OFFICER (recognised for pre-registration purposes) which will be graded Senior House Officer or House Officer in accordance with experience. Recognised for M.R.C.O.G. Post vacant on 5th January, 1956.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Thoracic Surgery. Post vacant 1st December, 1955. Salary £745 p.a., less £150 p.a. for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (orthopædic and fracture); duties to commence middle of December. The post offers exceptional experience in traumatic surgery. Salary and conditions of service in accordance with Ministry regulations.

Applications, stating age, qualifications and experience, nationality, &c., together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. HIGHBURY HOSPITAL. Senior House OFFICER (surgical) required at the above Hospital. Good opportunity for obtaining experience in all types of general surgery. Duties to commence on 1st December, 1955.

Applications, stating age, qualifications, nationality and experience together with copies of testimonials, to be sent to the Group Secretary, Nottingham General Hospital.

OXFORD. UNIVERSITY OF OXFORD. OXFORD REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR (wholetime) in Psychiatry to St. John's Hospital, Stone, Aylesbury (805 Beds). The successful applicant may be able to transfer to the Warneford Hospital, Oxford, for the second half of the appointment. Applicants should preferably hold the D.P.M. Married accommodation available.

Applications on forms obtainable from the Secretary, Joint Committee for Senior Registrars, 43, Banbury-road, Oxford, should reach him by 24th December.

OXFORD. UNIVERSITY OF OXFORD. UNITED OXFORD HOSPITALS. SENIOR REGISTRAR in General Surgery, non-resident, to the United Oxford Hospitals. Applicants must hold a F.R.C.S., or M.S. Diploma.

Applications on forms obtainable from Secretary, Joint Committee for Senior Registrars, 43, Banbury-road, Oxford, should reach him by 24th December.

OXFORD. UNITED OXFORD HOSPITALS. Senior REGISTRAR in Radiology to the United Oxford Hospitals, vacant 1st January, 1956.

Applications on forms obtainable from the Secretary, Joint Committee for Senior Registrars, 43, Banbury-road, Oxford, must reach him by 24th November, 1955.

PERTH ROYAL INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER (Anæsthetic Department). The post is recognised under regulations for the D.A. and F.F.A.R.C.S.

Applications, giving details of age, qualifications, experience, and names of 2 referees, should be sent to the Group Medical Superintendent, Perth Royal Infirmary, Perth.

PETERBOROUGH. THE MEMORIAL HOSPITAL. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (orthopædic). Applications are invited for this position, vacant now. Exceptional experience offered in busy department.

Apply to the Secretary, Memorial Hospital, Peterborough.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

HOUSE SURGEONS (pre-registration posts), 2 vacancies 1st January, 1956. Recognised for the F.R.C.S. Freedom Fields Section.

HOUSE SURGEON (pre-registration post), vacant 1st December, 1955, Devonport Section.

HOUSE PHYSICIAN (pre-registration post), vacant 1st January, 1956, Greenbank Road Section.

HOUSE SURGEONS (pre-registration posts), vacancies 12th December, 1955, 1st and 11th January, 1956. Recognised for the F.R.C.S. Greenbank Road Section.

Applications, stating age, nationality, qualifications, and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, GREENBANK ROAD. (Recognised for the F.R.C.S.) SENIOR HOUSE OFFICER in Surgery, vacant 1st February, 1956.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PONTEFRACT AND CASTLEFORD HOSPITAL MAN-AGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER to assist Geriatric Physician in the active Geriatric Unit at hospitals in this and Wakefield A Hospital Management Committee area. Married accommodation available. Car essential.

Applications immediately, giving names of 2 referees, to the Secretary, Great Northern House, Salter-row, Pontefract, Yorks.

PORTH AND DISTRICT HOSPITAL, Porth, Rhondda. (110 Beds—visited regularly by Consultants from Cardiff Royal Infirmary.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (surgical). Married quarters available. Maximum tenure of appointment 3 years but holder may apply for reappointment.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Courthouse-street, Pontypridd.

POOLE GENERAL HOSPITAL, Longfleet-road, Poole, DORSET. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer) required immediately. Post suitable for persons reading for higher diplomas.

Applications to the Hospital Secretary.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bourne-MOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (pre-registration) required 3rd December, 1955. The Hospital is recognised for the F.R.C.S. and F.R.C.S.E.

Applications to the Hospital Secretary.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Area Accident and Orthopædic Department), vacant mid-December. Duties including casualty work at Battle Hospital, Reading (343 Beds). Person appointed will work with Registrar and House Officers.

Apply, stating nationality, present post and qualifications with dates, together with names of 2 referees, to Acting Group Secretary, 3, Craven-road, Reading.

READING. ROYAL BERKSHIRE HOSPITAL, Applications are invited from registered medical practitioners only for the post of RESIDENT ASSISTANT PATHOLOGIST, vacant 6th December, 1955, and tenable for 6 months. Salary £525 p.a.

Write, stating age, qualifications with dates, nationality and present post with copy of 1 recent testimonial, to Secretary.

RICHMOND, SURREY. ROYAL HOSPITAL. (General Hospital. 121 Beds.) HOUSE PHYSICIAN (pre-registration) required. Post vacant 4th December, 1955.

Applications immediately to Administrative Officer.

RICHMOND, SURREY. ROYAL HOSPITAL. (General Hospital—121 Beds.) HOUSE SURGEON (pre-registration) required. Post vacant 6th December, 1955.

Applications immediately to Administrative Officer.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (603 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER to work in the Chest Unit (72 Beds) at the General Hospital, Rochford, and at the Lancaster House Chest Clinic, Southend-on-Sea, to commence duty mid-December. Good experience in general medicine essential, and previous experience in tuberculosis and diseases of the chest desirable. Salary £745 p.a.

Applications, stating age, &c., to be sent to the undersigned by 30th November, 1955. J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (neurosurgery) required from 18th January, 1956. Suitable for candidates seeking higher medical or surgical qualifications. Recognised for the F.R.C.S.(Eng.).

Apply to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE PHYSICIAN required from 25th January, 1956. Open to either pre-registration applicants or to fully qualified practitioners.

Apply to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER required in the Obstetric and Gynæcological Unit consisting of 88 obstetric and 52 gynæcological beds. Post recognised for the D.Obst.R.C.O.G. and M.R.C.O.G.

Applications should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) GYNÆCOLOGICAL HOUSE SURGEON (Male or Female) required from 20th January, 1956. Unit comprises 35 gynæcological and 6 maternity beds. Resident post open to either pre-registration applicants or to fully qualified practitioners. Appointment includes certain relief duties on the medical side.

Applications to Medical Superintendent as soon as possible. Hospital may be seen by arrangement (Tel.: Romford 7711).

RYDE, ISLE OF WIGHT. ROYAL ISLE OF WIGHT COUNTY HOSPITAL. (116 Beds.) RESIDENT HOUSE PHYSICIAN (pre-registration post), vacant early January.

Applications, with names of 2 referees, to Hospital Secretary.

RYDE, ISLE OF WIGHT. ROYAL ISLE OF WIGHT COUNTY HOSPITAL. (116 Beds.) RESIDENT HOUSE SURGEON (pre-registration post and recognised for F.R.C.S.), vacant early January.

Applications, with names of 2 referees, to Hospital Secretary.

SOUTHPORT GENERAL INFIRMARY. (Recognised for F.R.C.S. and pre-registration.) HOUSE SURGEON (general surgery and gynæcology). Post vacant 16th December.

Apply, with 2 copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds— 87 surgical.) 2 HOUSE SURGEONS required end of November and mid-December, 1955. Posts tenable for 6 months. Both recognised for F.R.C.S. and Pre-registration Service.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOS-PITAL. (278 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEON required immediately. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON AND WINCHESTER HOSPITAL MANAGEMENT COMMITTEES. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications invited from persons with experience of pædiatrics for the post of REGISTRAR (non-resident); vacant 1st February, 1956; to be attached to the Southampton Children's Hospital and to undertake work with an area team in the Southampton and Winchester hospitals. Possession of M.R.C.P. an advantage. Candidates may visit the hospitals concerned by prior arrangement if they so desire.

Forms of application, may be obtained from the undersigned and must be returned not later than 30th November, 1955.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON CHEST HOSPITAL. (261 Beds.) SENIOR HOUSE OFFICER required from January, to be responsible for Infectious Diseases Unit. The duties are such as to suit a candidate reading for higher examinations. The Unit is sited at a Hospital possessing up-to-date Tuberculosis and Thoracic Surgical Units, whilst the Southampton Group of hospitals as a whole affords excellent opportunities for study and experience in all branches of medicine.

Applications, together with copies of recent testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street Southampton.

SOUTHAMPTON EYE HOSPITAL. (32 Beds. Recognised for D.O. examination.) RESIDENT SENIOR HOUSE OFFICER required beginning December.

Applications, with copies of testimonials, should be forwarded as soon as possible to Secretary, Southampton Group Hospital Management Committee, Bullar-street.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order from 1st January, 1956, for a period of 6 months in each post. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON (Orthopædic Department), which is open to pre-registration candidates, and which becomes vacant during December. The Department has 48 Beds and a large outpatient turnover dealing with fractures and all types of orthopædic surgery.

Applications, stating age, nationality, qualifications, experience and naming 2 referees, to the Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRAR in Psychiatry required for Middlewood Hospital, Sheffield (2089 Beds). D.P.M. essential. House available. Appointment for 1 year in the first instance, reviewable annually. Opportunity for research and experience in the special branches of psychiatry available in the Hospital area.

Application forms and further details obtainable from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 28th November, 1955.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the following posts :—

Royal Infirmary Unit

(*a*) NON-RESIDENT SENIOR REGISTRAR in Orthopædics. Post vacant 9th January, 1956.

Closing date for applications 30th November, 1955.

Royal Hospital Unit

(*b*) RESIDENT SENIOR HOUSE OFFICER in Clinical Pathology. Pathological experience not essential but candidates must have previous clinical experience. The successful candidate will work in turn in the different branches of clinical pathology in the laboratories of The United Sheffield Hospitals.

Applications to be sent immediately.

Applications for the above posts should state age, qualifications and experience, give the names of 3 referees, and be sent to :—

For post (*a*) The Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

For post (*b*) The Superintendent, Royal Hospital, Sheffield, 1.

SHREWSBURY. EYE, EAR AND THROAT HOSPITAL. SENIOR HOUSE OFFICER (E.N.T.). Duties at E.N.T. Hospital (68 Beds) and Copthorne Hospital (168 Beds). Post recognised for the D.L.O.R.C.S.

Applications, with copy testimonials, to the Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SKIPTON (near). THE HOSPITAL, Grassington, near SKIPTON. Applications invited for RESIDENT MEDICAL OFFICER at above Hospital. Appointment is that of Senior House Officer or Junior Hospital Medical Officer, according to experience. The Hospital caters for tuberculosis patients, men and women.

Applications to Medical Superintendent.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (casualty) required, 1 of 2, for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications together with copies of 2 testimonials, to Hospital Secretary.

STIRLING AND CLACKMANNAN HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at Ochil Hills Hospital, Milnathort (116 Beds for pulmonary tuberculosis). The post becomes vacant on 1st December, 1955, and further particulars can be obtained from the Group Medical Superintendent, Stirling Royal Infirmary. The post is resident, and single or married quarters are available.

Applications, with full particulars of age, qualifications, and experience, with 3 names for reference, should be sent to the Secretary, 1, Randolph-road, Stirling.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Pædiatrics to fill a vacancy in the approved trainee establishment at the Bromley, Kent, Group of hospitals for duties mainly at Farnborough Hospital, Farnborough, Kent. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 3rd December, 1955.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertford-SHIRE. (384 Beds.) HOUSE SURGEONS (2) (House Officer grade) required for the 2 general surgical teams. Recognised for the F.R.C.S. Posts vacant approximately 8th and 11th December, 1955, respectively, and tenable for 6 months. Preference given to candidates seeking pre-registration posts under the Medical Act, 1950.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, stating clearly for which post application is being made.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE PHYSICIAN (House Officer grade) required to 1 of the 2 medical teams for duties mainly on the acute wards. Post vacant about 11th December, 1955, and tenable for 6 months. Preference given to candidates seeking pre-registration posts under the Medical Act, 1950.

Applications to the Group Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

STOCKPORT AND BUXTON HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the following posts which are approved for pre-registration purposes :—

Stockport Infirmary (163 Beds)

HOUSE OFFICER (general surgery and ophthalmology). Recognised for the F.R.C.S. and D.O.M.S. Vacant 5th March, 1956.

HOUSE OFFICER (general surgery and E.N.T.). Recognised for the F.R.C.S. and D.L.O. Vacant 1st February, 1956.

HOUSE OFFICER (general surgery and gynæcology). Recognised for the F.R.C.S. Vacant 24th January, 1956.

Stepping Hill Hospital (508 Beds)

HOUSE OFFICER (medicine), vacant 16th January, 1956.
HOUSE OFFICER (medicine), vacant 1st February, 1956.
HOUSE OFFICER (obstetrics), vacant 14th February, 1956.

Applications, stating age, qualifications, and experience, together with copies of 2 testimonials, to be addressed to the Group Secretary, 59B, Shaw-heath, Stockport, Cheshire, to be received not later than Wednesday, 7th December, 1955. The Appointments sub-Committee will meet at 5.15 P.M. on Wednesday, 7th December, 1955, at the Board Room at Stockport Infirmary, when all applicants are asked to attend for interview.

STOKE-ON-TRENT. BUCKNALL HOSPITAL. (182 Beds—58 isolation, 124 chronic sick.) RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER required. Married accommodation possible.

Detailed applications to Group Secretary, Stoke-on-Trent Hospital Management Committee, as soon as possible.

SUNDERLAND. THE ROYAL INFIRMARY. Casualty DEPARTMENT. A vacancy will occur in mid-November for a CASUALTY OFFICER (Senior House Officer grade). The Casualty Officer is to take charge of the Casualty Department, under the direct supervision of a Senior Surgeon. The post is recognised for the F.R.C.S.

Applications, with names of 2 referees, to the Hospital Secretary, Royal Infirmary, Sunderland.

SWANSEA. MOUNT PLEASANT HOSPITAL. (238 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics for the Maternity Unit of 40 Beds at the above Hospital. The post, which will become vacant on 1st February, 1956, is for a period of 12 months.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary not later than 17th December, 1955.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SWINDON HOSPITALS. (507 Beds.) Applications invited for 2 posts of RESIDENT HOUSE SURGEON in General Surgical Unit of 80 Beds at Victoria Hospital. Posts are recognised for F.R.C.S. and training under pre-registration internship regulations; vacant 18th January, 2nd February, 1956. Furnished married accommodation available.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon, Wilts., by 21st November.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SWINDON HOSPITALS. (507 Beds.) Applications invited for 2 posts of RESIDENT HOUSE PHYSICIAN in acute Medical Unit of 64 Beds at St. Margaret's Hospital. Posts recognised for training under pre-registration internship regulations and vacant 18th December, 1955, and 5th February, 1956.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon, Wilts., by 21st November.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for Unit of Obstetrics and Gynæcology, vacant 27th December. Post recognised for M.R.C.O.G.

Applications, stating age, experience and qualifications with dates, to Hospital Secretary.

WELSH REGIONAL HOSPITAL BOARD. Registrar in Psychiatry, Whitchurch Hospital, Cardiff (800 Beds). Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

VENTNOR, I.O.W. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST. (249 Beds.) Required, for vacancy occurring end December, JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (resident post). Hospital has all facilities for Major Thoracic Surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) HOUSE PHYSICIAN (pre-registration), vacant 1st January, 1956.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (311 Beds.) HOUSE SURGEON to the Senior Surgeon, vacant 1st January.

Applications, with copies of 2 testimonials, to be sent to the Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General Surgery required (Male or Female) for post vacant 1st February. Recognised for F.R.C.S. Preference given to persons seeking a pre-registration post. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, with copies of recent testimonials, to Hospital Secretary.

WOLVERHAMPTON GROUP.

The Royal Hospital (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopaedic Department), vacant now.

HOUSE OFFICER (general medicine), pre-registration post, vacant 1st December.

Apply Secretary with copies of testimonials.

WOLVERHAMPTON GROUP.

The Royal Hospital

JUNIOR PATHOLOGIST required. Salary in Junior Hospital Medical Officer grade. Comprehensive service offering wide experience and training. Resident post vacant 1st January, 1956. Candidates may visit Pathologist.

Applications to Group Secretary, The Royal Hospital, Wolverhampton.

WOODFORD GREEN, ESSEX. HARTS HOSPITAL. (100 Beds.) SENIOR HOUSE OFFICER required. Post vacant 1st January, 1956. The Hospital is a modern sanatorium with a Thoracic Surgical Unit and Area Chest Clinic. The post offers exceptional opportunity for gaining experience in tuberculosis and diseases of the chest. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WORCESTER ROYAL INFIRMARY. Applications invited for post of PAEDIATRIC HOUSE PHYSICIAN (pre-registration or otherwise.)

Apply, with copies of testimonials, to the Secretary.

WORCESTER ROYAL INFIRMARY. Applications invited for HOUSE SURGEON posts (pre-registration or otherwise.

Apply, with copies of testimonials, to the Secretary.

YORK. MATERNITY AND FULFORD HOSPITALS. YORK A AND TADCASTER HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Obstetrics and Gynaecology. Required 1st January, 1956. Recognised for M.R.C.O.G.

Applications, stating age, qualifications, experience, nationality, and names of 2 referees, to the Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as REGISTRAR in E.N.T. Surgery at hospitals managed by the Belfast Hospital Management Committee. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 3rd December, 1955.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invites applications from provisionally registered practitioners for appointments as HOUSE OFFICERS (pre-registration) in the Departments of Medicine, Surgery and Obstetrics.

Candidates must be prepared to serve in any of the above departments, and as far as possible preferences will be observed.

Duration of appointments: Appointments will be for 12 months (2 departments) or 6 months in the case of an officer who has already completed a 6 months pre-registration appointment.

Salary: £570 p.a., plus inducement addition of £180 p.a. where applicable.

Outfit allowance: £60 payable on first appointment, unless the candidate has previously received such an allowance.

Quarters: Partly furnished quarters are provided at a rental of 8½% of salary, excluding inducement addition. Candidates will be expected to share quarters.

Leave: Leave will be granted on full salary at the rate of 5 days (or 7 days in the case of expatriate officers) for each month of service in Nigeria on satisfactory completion of contract.

Passages: Passages to and from Nigeria will be provided for expatriate officers, and they may be required to travel by air. Successful candidates will be required to commence duty in January/February, 1956.

Applications should be submitted not later than 5th December, 1955, on the appropriate form, which can be obtained, with further particulars, on receipt of an addressed foolscap envelope, from the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, London, S.W.1.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invites applications from fully registered medical practitioners for the following appointments which will become vacant early in 1956.

(*a*) REGISTRARS :
Surgery—1 vacancy.
Anaesthetics—1 vacancy.

(*b*) HOUSE OFFICERS : 2 vacancies.

Candidates must be prepared to serve in any of the following Departments : Medicine, Surgery, Obstetrics, Anaesthetics or Paediatrics, but individual preferences will be observed as far as possible.

Duration of appointments:
Registrars : 1 tour of 12 months in the first instance, renewable by mutual agreement for a further tour of 12 months.
House Officers : 1 year—6 months to be spent in each of 2 departments.

Salaries:
Registrar : £1020 p.a., plus inducement addition of £270 p.a. where applicable.
House Officer : £924 p.a., plus inducement addition of £240 p.a. where applicable.

Gratuities: On satisfactory completion of agreement, a gratuity of £25 (or £37 10s. on salaries of over £1000 p.a.) will be paid for each completed period of 3 months service.

Outfit allowance: £60 payable on first appointment.

Quarters: Partly furnished quarters are provided at a rental of 8½% of salary, excluding inducement addition. House Officers may be required to share quarters.

Leave and Passages: Expatriate officers will be eligible for 7 days leave on full pay for each completed month of service in Nigeria. Free first-class passages are provided for expatriate officers and their wives.

Children's allowances: Officers will be eligible for children's allowances in accordance with the existing regulations.

Superannuation: Arrangements can be made to enable officers to continue their National Health Service superannuation scheme contributions.

Applications should be submitted not later than 5th December, 1955, on the appropriate form, which can be obtained, with further particulars, on receipt of addressed foolscap envelope, from the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, London, S.W.1.

NEW YORK CITY SUBURB. HEMPSTEAD GENERAL HOSPITAL. (200 Beds.) RESIDENT HOUSE OFFICERS, $300 per month, full board ; married accommodation available. Excellent opportunity for training in new superbly equipped institution with outstanding staff and active teaching programme. Appointments 1st March and 1st July, 1956.

Apply now, stating age, education and experience, letters from 2 referees, Hempstead General Hospital, 800, Front-street, Hempstead, L.I., New York, U.S.A.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. PSYCHIATRY RESIDENCIES available in 600-Bed University Teaching, General Hospital with 60-Bed acute treatment Psychiatric Unit fully approved for 3 years training. Experience includes dynamically-oriented psychotherapy with children and adults, shock therapies and neurologic training. Salary range $1920–$4000 annually, plus laundry, uniforms, and room.

Address inquiries to Medical Director.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. INTERNSHIPS and RESIDENCIES available in 600-Bed general, private Albany Hospital, directly connected with Albany Medical College. Approved for all major specialties. Participating in Exchange-Visitor Programme. Salary range $1620–$2520 annually in addition to laundry, uniforms and room. All appointments begin 1st July, 1956.

For further information apply to Medical Director.

Public Appointments

BARBADOS GENERAL HOSPITAL. A Medical Officer is required at the General Hospital, Barbados. Duties are general and those ordinarily performed in a large acute general hospital of 336 Beds, including medicine, surgery, obstetrics, theatre and ward work, anaesthetics, casualty, outpatients and other departmental duties as may be directed. Candidates must possess qualifications registrable in the United Kingdom. Appointment will be on agreement for 3 years. Salary scale is $3600–$4800 (£750–£1000) a year, starting salary depending upon candidate's age and experience. A temporary cost-of-living allowance of $156 (£32 10s.) p.a. is also payable. Free furnished quarters are provided. Free passages to Barbados are provided for the Officer, wife and children on first appointment and back to the United Kingdom on the satisfactory completion of the agreement, subject to a total maximum cost of $1440 (£300) each way. Income-tax at local rates. Social and recreational amenities are good. Climate is healthy for Europeans. Educational facilities are available.

Application forms can be obtained from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/28/02).

BRITISH TRANSPORT COMMISSION (British Railways), LONDON MIDLAND REGION. Applications are invited from Male registered medical practitioners, aged 30–40, for appointment as ASSISTANT MEDICAL OFFICER in the London Midland Region, British Railways. Candidates should have a good clinical background and an interest in industrial medicine. Experience in general practice is desirable. Salary on appointment £1250 p.a., and membership of the superannuation fund, subject to medical examination, obligatory.

Applications, giving full particulars of age, qualifications, and experience and 2 references, should be sent to the Regional Medical Officer, British Railways, London Midland Region, 66, Drummond-street, Euston, N.W.1, not later than 30th November, 1955.

BRISTOL. CITY AND COUNTY OF BRISTOL. Department of Public Health. Applications invited from registered medical practitioners for appointment of ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER (Male). Salary £975–£50(8)–£1375 p.a. Successful applicant required to carry out maternity and child welfare, school health and port health work, and such other duties as may be required by Medical Officer of Health, and must devote his whole-time to these duties and not engage in private practice. Appointment superannuable and subject to passing medical examination.

Applications, on forms obtainable from undersigned, to be returned by 23rd November, 1955.

R. H. PARRY, Medical Officer of Health.
Central Health Clinic, G.P.O. Box No. 201,
Tower Hill, Bristol, 2.

CANADA. Psychiatrists required for senior positions in Psychiatric Services, Saskatchewan, Canada. Candidates should have at least Senior Registrar status and D.P.M. Starting salary $6384 with 5 years experience and D.P.M., with opportunities for early promotions to salary ranges of $7000–$11,000.

Immediate written applications are invited with details of training and experience addressed to Director of Psychiatric Services, care of 28, Chester-street, London, S.W.1. Interviews will be arranged in the United Kingdom at the end of November.

CHESHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as ASSISTANT COUNTY MEDICAL OFFICER on the county medical staff (South Cheshire area). The work will be concerned mainly with medical inspection of school-children, and experience in the ascertainment of handicapped children will be an advantage. It will also include attendance at child welfare centres. The appointment is superannuable and subject to medical examination. Salary scale £975–£50–£1375, with car allowance and subsistence allowance according to the county scale (previous experience will be taken into consideration).

Forms of application may be obtained from the undersigned, to whom they should be returned not later than 10th December, 1955. ARNOLD BROWN, County Medical Officer.

24, Nicholas-street, Chester.

DUBLIN. LOCAL APPOINTMENTS COMMISSION. Vacancy for PATHOLOGIST, Limerick County Council. Essential qualifications include (i) at least 3 years specialisation in pathology, (ii) M.D., M.Sc., M.R.C.P.I., or the Diploma in Clinical Pathology, or equivalent. Salary: £1900.

Application forms and particulars from the Secretary of the Commission, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms 5 P.M. on 2nd December, 1955.

GOLD COAST LOCAL CIVIL SERVICE. Gold Coast Medical Service. SPECIALIST ANÆSTHETIST required by Ministry of Health, Gold Coast, for administration of anæsthesia, to advise the Ministry on the practice of anæsthesia including the ordering of equipment and drugs, and for training of selected personnel in anæsthetics. Candidates should be registered medical practitioners holding a Fellowship of the Faculty of Anæsthetists (F.F.A.R.C.S.), or a Diploma in Anæsthetics (D.A.), provided the latter qualification was obtained prior to November, 1953, and must have had not less than 4 years approved full-time hospital experience in general anæsthetic work, preferably under the direction of a fully qualified specialist. The stated 4-year period must be exclusive of hospital experience gained in house posts during the 12 months after medical registration. Appointment is to the Gold Coast Civil Service on contract of 2 tours of 18–24 months each in the first instance with gratuity (taxable) on satisfactory completion of service. Salary scale £2400–£2700 a year. Gratuity is £37 10s. for each completed 3 months of service. Candidates in the National Health Service may leave the National Health Service but retain their superannuation rights (up to a maximum stay of 6 years). Salary, in this case, would be in the scale £1900–£2200 a year, and the gratuity 20% of the aggregate of salary. Quarters when available are provided at rental not exceeding £150 p.a. Income-tax at local rates. Free passages provided for officer, wife, and up to 3 children under 13 years of age. Generous home leave is granted after each tour of 18–24 months.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/13/01).

ST. HELENS. COUNTY BOROUGH OF ST. HELENS. Applications are invited for the appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. The duties will include work in connection with all branches of the Public Health and Health Services and the day-to-day administration of the School Health Service. In the absence of the Medical Officer of Health the person appointed will take administrative control of the Department. Candidates must have had experience in a Public Health Department and possess the D.P.H. He should also be approved by the Ministry of Education for the purpose of ascertainment of mentally defective and physically handicapped children. Salary will be at the rate of £1293 6s. 8d. p.a., rising by annual increments of £51 10s. to a maximum of £1550 16s. 8d. p.a. Travelling expenses or a motor-car allowance in accordance with the Council's scale will also be payable. The appointment will be subject to the provisions of the Local Government Superannuation Acts.

Forms of application may be obtained from the Medical Officer of Health, Town Hall, St. Helens, and completed applications accompanied by copies of not more than 3 recent testimonials, should reach him not later than 28th November, 1955. Candidates must, when making application, disclose in writing whether to their knowledge they are related to any member of the Council or to a holder of any senior office under the Council. Canvassing members of the Council or Committees of the Corporation will be a disqualification.

G. O'BRIEN, Medical Officer of Health.

Town Hall, St. Helens, November, 1955.

HER MAJESTY'S OVERSEA SERVICE. Sierra Leone. MEDICAL OFFICERS are urgently required for general duties including hospital and district work in order to maintain existing standards of service to the public and to make possible much needed expansion. The appointments offer scope for the practice of many branches of medicine and surgery and carry a considerable measure of independence and personal responsibility. Arrangements exist for allowing private practice at the discretion of the Director of Medical Services. Candidates must possess medical qualifications registrable in the United Kingdom and have had at least 12 months postgraduate hospital experience.

There is a permanent career for doctors entering the Sierra Leone Service, but short-term contracts are available. Alternative methods of entry are as follows :—

(*a*) on 3 years probation for permanent and pensionable employment with retiring age of between 45 and 55. Pensions (which are non-contributing) are at the rate of 1/600th of the final pensionable emoluments for each completed month of reckonable services.

(*b*) from the National Health Service. Candidates may resign but retain their superannuation rights up to 6 years and receive a gratuity (taxable) of 20% of the aggregate of their salary.

Salaries, including pensionable expatriation pay, for Officers under (*a*) and (*b*) range from £942 to £1850 a year, or

(*c*) on short-term contract (2 tours of 18–24 months duration each), with inclusive salaries from £1068 to £2000 a year. On completion of contract a gratuity (taxable) is paid at the rate of £37 10s. for each completed period of 3 months service (including leave).

Starting salaries are determined according to age, qualifications and experience. Opportunities exist for transfer and promotion to posts elsewhere in Her Majesty's Oversea Service outside Sierra Leone. Quarters are normally available at low rental. Free passages in both directions are provided for officer, wife, and up to 2 children under the age of 10. Income-tax at local rates. Local leave is permissible and generous home leave is granted after each tour of 18–24 months duration. The short tours of service enable frequent visits to be made to children being educated at home. Many officers have their children with them until they reach school age.

Application forms from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/15/02).

HER MAJESTY'S OVERSEA CIVIL SERVICE. Medical Branch—Western Nigeria. Applications are invited from doctors with medical qualifications registrable in the United Kingdom for the following posts in the Medical Department of the Western Region of Nigeria :—

(i) MEDICAL OFFICERS to undertake general medical work including minor and emergency surgery in small country hospitals and general health work including the supervision of rural schools, maternity and child welfare clinics. Candidates must have at least a years post-registration experience.

(ii) MEDICAL OFFICERS OF HEALTH who will normally be based at 1 of the larger urban centres in the Region, where they will be primarily responsible for the public health administration of the area, with special emphasis on sanitation and hygiene. Duties include school health, public health, education and propaganda, and the control of quarantinable diseases. Duties may also include the establishment and supervision of maternity, child welfare and tuberculosis centres. Candidates with special aptitude and inclination for teaching may be selected to take charge of the new School of Hygiene for the training of sanitary inspectors, which is being established in Ibadan. Candidates should possess a Diploma in Public Health. A qualification in tropical medicine and hygiene and experience in public health practice are desirable but not essential.

(iii) PATHOLOGIST who will be responsible for a Regional Laboratory Service which he will have to organise. Most hospitals in the Region have small laboratories attached where routine work is performed, but the more complicated tests, sections, &c., will be the selected officer's concern at a Central Regional Laboratory. He will have to supervise and encourage the work of African Technicians which will necessitate travelling. Candidates should possess a Diploma in Pathology or equivalent qualification, and have had 2 years experience in laboratory work.

Appointments may be made as follows :—

(*a*) on 3 years probation for permanent and pensionable employment with retiring age of between 45 and 55. Pensions (which are non-contributory) are at the rate of 1/600th of final pensionable emoluments for each completed month of reckonable service.

(*b*) from the National Health Service. Candidates may leave the National Health Service but retain their superannuation rights up to six years and receive a gratuity (taxable) of 20% of the aggregate of their salary.

Salaries, including oversea pay, for expatriate officers appointed under (*a*) or (*b*) range from £950 to £1850 p.a., or

(*c*) on short-term contract (2 tours of 18–24 months duration) with inclusive salary of from £1087 p.a. rising to £2000 p.a. On completion of contract a gratuity (taxable) is paid at the rate of £37 10s. for each completed period of 3 months service (including leave).

Officers appointed under (*a*) or (*c*) are required to contribute to a Widows' and Orphans' Pension Scheme. Quarters are provided at low rents. Free passages in both directions are provided for officer and his wife. Payment of the cost actually incurred on 1 outward and 1 homeward passage for each of 2 children under age of 18, subject to maximum of £75 in respect of the return journey for each child, is also granted. A salaries commission has been sitting in Western Nigeria and any terms which may come into force as a result of it will apply to the selected officers. Income-tax at low local rates. Local leave is permissible and generous home leave is granted after each tour of 18–24 months.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/410/018).

HER MAJESTY'S EMBASSY AT WARSAW. Applications are invited for the post of MEDICAL OFFICER at above Embassy. Candidates should be British by birth, male, preferably single, and should, if possible, have surgical as well as medical qualifications. Duties would be mainly clinical and would include medical care of staff of Her Majesty's Embassy and their families, together with limited number of staffs of other diplomatic missions in Warsaw. Appointment would carry (*a*) taxable salary and pay addition between £830 and £1325 p.a. depending on age and experience, (*b*) non-taxable allowance at present amounting to £785 for single man and £1225 for married couple, (*c*) rent allowance to cover cost of furnished accommodation. Appointment which carries diplomatic status, would be for 1 year in first instance.

Write, giving date of birth, education, full details of qualifications and experience of posts held (including dates), to E.F.522, London Appointments Officer, Ministry of Labour and National Service, 1–6, Tavistock-square, W.C.1, by 3rd December, 1955. No original testimonials should be sent.

MANCHESTER. CITY OF MANCHESTER EDUCATION COMMITTEE. Applications are invited for the post of MEDICAL OFFICER (School Health). Preference will be given to candidates who have had special experience in diseases of children and retinoscopy, and hold D.P.H. or D.C.H. Salary £975–£1375.

Application form and particulars (stamped addressed foolscap envelope) from the Chief Education Officer, P.O. Box 480, Education Offices, Deansgate, Manchester, 3. To be returned by 17th December, 1955.

STAFFORDSHIRE COUNTY COUNCIL. Appointment of ASSISTANT COUNTY MEDICAL AND SCHOOL MEDICAL OFFICERS. Applications are invited from fully qualified medical practitioners for the above-mentioned appointments and those holding the Diploma of Public Health will be given preference. The candidates appointed will undertake clinical work in the School Health and Child Welfare Services under the direction of the County Medical Officer of Health and will be required to perform such other duties as may from time to time be prescribed. The salary scale is £975 p.a., rising by annual increments of £50 to a maximum of £1375 p.a., and previous similar service may be taken into consideration when deciding the commencing rate. The selected candidates will be required to provide a motor-car, for which allowances will be paid in accordance with the County Council scale. A lodging allowance of 25s. per week and return railway fare home every 2 months will be paid for a maximum period of 6 months where the successful candidate is married and has to continue to maintain a home outside the geographical County while seeking housing accommodation. Each appointment will be terminable by 3 months notice in writing on either side and subject to the provisions of the appropriate Superannuation Acts and Regulations, in which connection the selected candidates must pass a medical examination and submit their birth certificates.

Forms of application may be obtained from the undersigned and should be returned to the County Medical Officer of Health, County Buildings, Stafford, not later than 25th November, 1955, together with copies of not more than 3 recent testimonials.

T. H. EVANS, Clerk of the County Council.

County Buildings, Stafford, 28th October, 1955.

WEST BROMWICH. COUNTY BOROUGH OF WEST BROMWICH. Applications are invited from registered medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. This post affords an excellent opportunity of acquiring extensive experience in maternity and child welfare, school medical work and other general duties of a public health department. Possession of the D.P.H. or D.C.H. though not essential would be an advantage. Salary £975–£50–£1375. The post is superannuable and subject to a medical examination and 2 months notice on either side.

Applications, with full particulars of experience, should be made to the undersigned not later than 26th November, 1955, and should give the names of 3 persons to whom reference can be made.

Town Hall, West Bromwich. J. M. DAY, Town Clerk.

WARWICKSHIRE COUNTY COUNCIL. Rural Districts OF MERIDEN AND TAMWORTH. Appointment of MEDICAL OFFICER OF HEALTH AND AREA MEDICAL OFFICER. Applications are invited from registered medical practitioners holding a Diploma in Public Health or similar qualification for the above-mentioned appointments. The officer will be regarded as spending 50% of his time on each of the appointments enumerated. The salaries payable are as under :—

(*a*) As Medical Officer of Health—a commencing figure between £862 10s. and £965 p.a., according to the qualifications and experience of the successful candidate, with 4 annual increments of £26 5s. (Industrial Court Award 2565).

(*b*) As Area Medical Officer—£915 12s. 6d. p.a., rising by annual increments as prescribed to a maximum of £1175 p.a. (Spens formula).

The person appointed will not be permitted to engage in private practice and will be required to devote the whole of his time to the duties of the 2 offices.

Forms of application and further particulars and conditions of appointment can be obtained from the Clerk of the Meriden Rural District Council, Old Bank House, Coleshill, near Birmingham. Canvassing in any form will disqualify. Closing date for applications 14th December, 1955.

WORCESTERSHIRE COUNTY COUNCIL. Assistant COUNTY MEDICAL OFFICER. Applications from registered medical practitioners with D.P.H. are invited for this appointment in the Oldbury area. Salary scale £975 rising by £50 to £1375.

Application forms from County Medical Officer, County Buildings, Worcester (D.280).

LINCOLN. COUNTY OF LINCOLN—Parts of Kesteven. Applications are invited from fully qualified medical practitioners (Women) for the appointment of ASSISTANT COUNTY MEDICAL OFFICER. The salary scale is £975 p.a. rising by annual increments of £50 to a maximum of £1375. Commencing salary according to experience.

Application forms, together with terms and conditions of appointment, can be obtained from the Clerk of the County Council, County Offices, Sleaford, to be returned not later than 10th December, 1955.

J. E. BLOW, Clerk of the County Council.

County Offices, Sleaford, Lincs, November, 1955.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

HADLEY, near WELLINGTON, SHROPSHIRE. Applications are invited for a VACANCY at Hadley, near Wellington, Shropshire. There is no list, but the successful applicant will be granted the initial practice allowance, if eligible. The population of Hadley is approximately 4000, and there is no resident doctor in the town. Apply on Form E.C.16A before 3rd December, 1955, to—

F. MOONEY, Clerk of the Salop Executive Council.

"Abbeydale," 39, Abbey-foregate, Shrewsbury.

SURBITON (CHESSINGTON AND HOOK), SURREY. Applications invited for VACANCY due to death in above urban area (intermediate). List about 1300. Separate surgery available to rent and residence may be available for purchase. Applications on Form E.C.16A to reach the undersigned not later than 2nd December, 1955.

S. H. BENNETT, Clerk of the Council.

187, Ewell-road, Surbiton.

WEST MEON, HAMPSHIRE. Applications invited for VACANCY (mainly rural) due to resignation. List at present approximately 1430, chiefly dispensing. Residence and surgery available for purchase if desired. Apply, on Form E.C.16A, before 9th December, 1955, to—

F. STEED, Clerk of the Hampshire Executive Council.

37, Southgate-street, Winchester.

Hospital Services : Non-Medical Appointments

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. OPERATING THEATRE TECHNICIAN (Male) required at Royal Southern Hospital, Caryl-street, Liverpool, 8. Candidates should be members of Association of Operating Theatre Technicians (1st Class) and on National Register of Medical Auxiliary Services. Salary and conditions of service in accordance with Whitley Council agreements.

Applications, stating age and full details of experience, with names of 2 referees, to be addressed to the Superintendent.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

The National Birthday Trust Fund, 57, Lower Belgrave-street, S.W.1. Applications are requested for the post of Director of an Inquiry into Maternity Services, with special reference to Perinatal Mortality. Preferred resident in the Edinburgh area. Part-time appointment considered. Salary and period of engagement by arrangement.

Applications, with details of qualifications, experience and 3 testimonials, should be sent to the Secretary of the Trust at the above office by 17th December.

Locum required, country practice. Nov. 25th and 26th. —W. A. TAYLOR, Banwell, Somerset.

Part-time services of Medical Practitioner required by manufacturers of Biological products in connection with clinical investigations in hospitals and to advise generally.—Address, No. 179, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moder-ate prices by experienced medical typists. Electric machines. —SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM. 5329/0504).

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Austin. The New Show Models A.30, A.40, A.50, and A.90. Limited number of deliveries now available to proven essential users.—Demonstrations, brochures, easy terms, application forms, on request from H. A. SAUNDERS LTD., Austin House, 140–144, Golders Green-road, Golders Green, N.W.11.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, November 19, 1955.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

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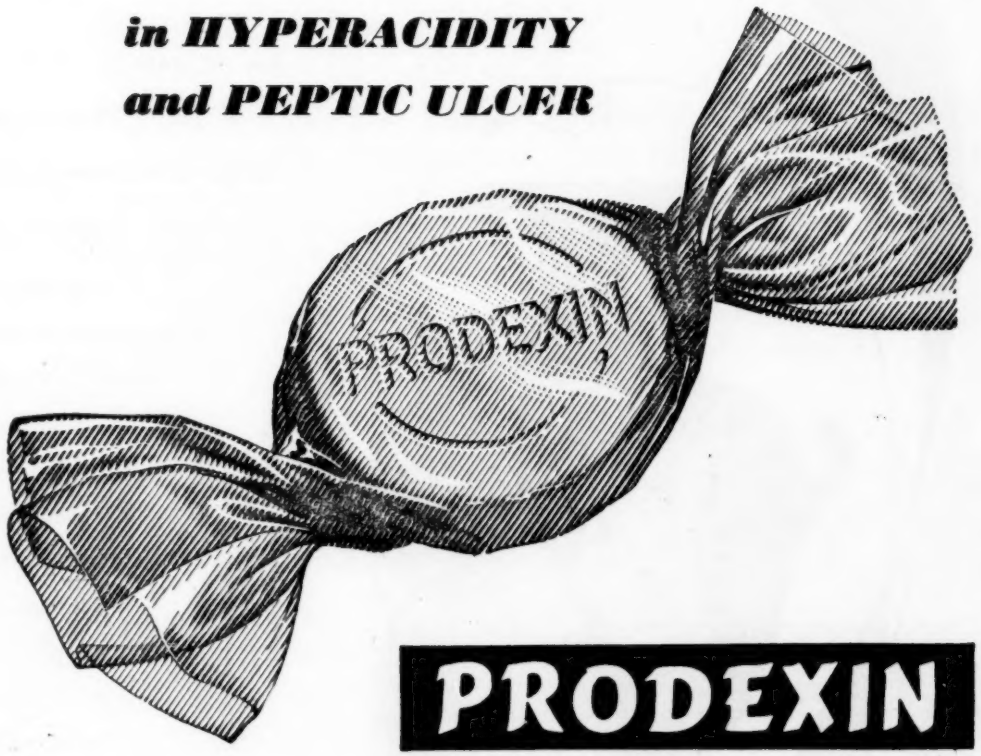

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Reference: *Practitioner*, 173: 46, 1954.

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